



City of Big Bear Lake
Department of Water and Power

FINAL



2015

Urban Water Management Plan

Volume 1 – Main Report

June 2016


Engineers...Working Wonders With Water™

2015 URBAN WATER MANAGEMENT PLAN

Big Bear Lake DWP

JUNE 2016

FINAL



BIG BEAR LAKE DWP
2015 URBAN WATER MANAGEMENT PLAN

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LIST OF ABBREVIATIONS

Abbreviation	Description
AB	Assembly Bill
af	acre feet
afy	acre feet per year
AMI	Advanced Metering Infrastructure
AWWA	American Water Works Association
Basin	Bear Valley Groundwater Basin
BBCCSD	Big Bear City Community Services District
BBARWA	Big Bear Area Regional Wastewater Agency
BMP	Best Management Practice
BVWSP	Bear Valley Water sustainability Project
CASGEM	California Statewide Groundwater Elevation Monitoring
CCR	Consumer Confidence Reports
City	City of Big Bear Lake
CLAWA	Crestline Lake Arrowhead Water Agency
CIMIS	California Irrigation Management Information System
County	San Bernardino County
CSA 53B	County of San Bernardino County Service Area 53B
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
DWP	City of Big Bear Lake Department of Water and Power
DWR	Department of Water Resources
DMM	Demand Management Measures
DWR	Department of Water Resources
ETo	Evapotranspiration
gpcd	gallons per capita per day
gpm	gallons per minute
ITP	Independent Technical Panel
MOU	Memorandum of Understanding
MWD	Big Bear Municipal Water Department
RHNA	Regional Housing Needs and Allocation
SB	Senate Bill
ULFT	Ultra Low Flush Toilet
UWMP	Urban Water Management Plan
UWMPA	Urban Water Management Planning Act
Valley	Bear Valley
WWTP	Wastewater Treatment Plan

City of Big Bear Lake Department of Water and Power
2015 Urban Water Management Plan

Contact Sheet

Date plan submitted to the Department of Water Resources: June 29, 2016

Name of person(s) preparing this plan:

Sierra Orr, Water Conservation and Public Information Specialist
Phone: (909) 866-5050 x 202
Fax: (909) 866-3184
Email: sorr@bbldwp.com

Inge Wiersema, Project Manager
Carollo Engineers
Phone: (213) 489-1587
Fax: (213) 572-0361
Email: iwiersema@carollo.com

The Water supplier is a: **Municipality**

The Water supplier is a: **Retailer**

Utility services provided by the water supplier include: **Water**

Is This Agency a Bureau of Reclamation Contractor? **No**

Is This Agency a State Water Project Contractor? **No**

INTRODUCTION

1.1 BACKGROUND AND PURPOSE

The California Water Code requires urban water suppliers to prepare and adopt Urban Water Management Plans (UWMPs) for submission to the California Department of Water Resources (DWR). The UWMPs must be filed every five years to satisfy the requirements of the Urban Water Management Planning Act (UWMPA) of 1983, including amendments that have been made to the Act and other applicable regulations. The UWMPA requires urban water suppliers servicing 3,000 or more connections or supplying more than 3,000 acre-feet (af) of water annually, to prepare an UWMP.

The purpose of the UWMP is to maintain efficient use of urban water supplies, continue to promote conservation programs and policies, verify that sufficient water supplies are available for future beneficial use, and provide a mechanism for response during drought conditions. This report, which was prepared in compliance with the California Water Code and as set forth in the guidelines established by the DWR, constitutes the City of Big Bear Lake Department of Water and Power's 2015 UWMP.

1.1.1 Previous Urban Water Management Plan

The City of Big Bear Lake Department of Water and Power (DWP) previously prepared an UWMP in 2010, which was approved and adopted on June 26, 2012. The 2015 UWMP report serves as an update to the 2010 UWMP and pulls extensively from that report. References used in the writing of this report can be found in Appendix A.

1.2 URBAN WATER MANAGEMENT PLANNING AND THE CALIFORNIA WATER CODE

The California Water Code (CWC) sections applicable to UWMPs are summarized in the sections below.

1.2.1 Urban Water Management Planning Act

The CWC Division 6 was modified by AB 797 and the creation of the UWMPA in 1983. Several amendments to the original UWMPA increased data requirements and the planning elements to be included in the 2005, 2010, and 2015 UWMPs.

Initial amendments to the UWMPA required that total projected water use be compared to water supply sources over 20 years, in 5-year periods. Recent DWR guidelines also suggest projecting through a 25-year planning horizon to maintain a 20-year timeframe until the next UWMP update has been completed and for use in developing Water Supply Assessments.

Other amendments require that UWMPs include provisions for recycled water use, demand management measures, and a water shortage contingency plan. The UWMPA requires inclusion of a water shortage contingency plan, which meets the specifications, set forth therein. Recycled water was added to the reporting requirements for water usage and figures prominently in the requirements for evaluation of alternative water supplies when supply shortages are predicted. Each water supplier must also describe their water Demand Management Measures (DMM) that are implemented or scheduled for implementation.

In addition to the UWMPA and its amendments, there are several other regulations that are related to the content of the UWMP. In summary, the key relevant regulations are as follows.

- AB 1420: Requires implementation of demand management measures/ BMPs and meeting a 20 percent demand reduction by 2020 to qualify for water management grants or loans.
- AB 1465: Requires water suppliers to describe opportunities related to recycled water use and stormwater recapture to offset potable water use.
- Amendments SB 610 (Costa, 2001) and AB 901 (Daucher, 2001): Require counties and cities to consider information relating to the availability of water to supply new large developments by mandating the preparation of further water supply planning (Daucher) and Water Supply Assessments (Costa).
- SB 1087: Requires water suppliers to report projected water demands for planned lower income units.
- Amendment SB 318 (Alpert, 2004): Requires the UWMP to describe the opportunities for development of desalinated water, including but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.
- AB 105 (Wiggins, 2004): Requires urban water suppliers to submit their UWMPs to the California State Library.
- SB X7-7 (Water Conservation Act of 2009): Requires development and use of new methodologies for reporting population growth estimates, baseline per capita use, and per capita targets for years 2015 and 2020. To be eligible for State water grants or loans, retail water suppliers are required to comply with water conservation requirements in SB X7-7.
- AB 2067 (2014): Requires urban water suppliers to provide narratives of water demand management measures and submit its 2015 plan to the Department of Water Resources (DWR) by July 1, 2016.
- SB 1420 (2014): Requires the UWMP, or amendments to the plan, to include any standardized forms, tables, or displays specified by the DWR and submitted electronically to DWR. Provides for water use projections to display and account for the water savings estimated when that information is available and applicable.

- SB 1036 (2014): Provides for the UWMP to include energy-related information.
- AB 2409 (2014): Requires urban water suppliers to analyze and define water features that are artificially supplied with water separately.

Since the 2010 UWMP, new requirements were identified and summarized in Section 1.2.2.

1.2.2 Applicable Changes to the Water Code since 2010 UWMPs

The changes to the California Water Code since 2010 UWMPs are summarized in Table 1.1.

Table 1.1 Applicable Changes to the Water Code since 2010 UWMPs			
Topic	CWC Section	Legislative Bill	Summary
Demand Management Measures	10631 (f) (1) and (2)	AB 2067, 2014	Requires water suppliers to provide narratives of water demand management measures.
Submittal Date	10621 (d)	AB 2067, 2014	Requires each urban water supplier to submit its 2015 plan to the Department of Water Resources by July 1, 2016.
Electronic Submittal	10644 (a) (2)	SB 1420, 2014	Requires the plan, or amendments to the plan, to be submitted electronically to the department.
Standardized Forms	10644 (a) (2)	SB 1420, 2014	Requires the plan, or amendments to the plan, to include any standardized forms, tables, or displays specified by the department.
Water Loss	10631 (e) (1) (J) and (e) (3) (A) and (B)	SB 1420, 2014	Requires a plan to quantify and report on distribution system water loss.
Estimated Future Water Savings	10631 (e) (4)	SB 1420, 2014	Provides for water use projections to display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans, when that information is available and applicable to an urban water supplier.
Voluntary Reporting of Energy Intensity	10631.2 (a) and (b)	SB 1036, 2014	Provides for an urban water supplier to include certain energy-related information, including, but not limited to, and estimate of the amount of energy used to extract or divert water supplies.
Defining Water Features	10632	AB 2409, 2014	Requires urban water suppliers to analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains separately from swimming pools and spas.

1.2.3 Water Conservation Act of 2009 (SB X7-7)

Beginning in 2016, retail water suppliers are required to comply with the water conservation requirements in SB X7-7 in order to be eligible for State water grants or loans. The SB X7 - 7 Verification Forms are included in Appendix B.

1.3 REPORT ORGANIZATION

This UWMP contains ten chapters, followed by appendices that provide supporting documentation for the information presented in the report. The chapters are briefly described below:

Chapter 1 – Introduction. This chapter presents the purpose of this UWMP stressing the importance and extent of the water management planning efforts.

Chapter 2 – Plan Preparation. This chapter provides information on the process for developing the UWMP as well as coordination efforts with appropriate local agencies and discusses the measures used to solicit public participation during the development of the UWMP.

Chapter 3 – System Description. This chapter presents a description of the water purveyor's service area and its characteristics including climate, population, and other demographic factors.

Chapter 4 – System Water Use. This chapter presents a description of the DWP's current and projected water uses within the service area through the year 2040.

Chapter 5 – Baselines and Targets. This chapter discusses DWP's methods for calculating the baseline and target water consumption and demonstrates the achievement of the 2015 interim water use target further describing plans for achieving the 2020 water use target. This chapter provides analyses associated with calculations of the water conservation target pursuant to SB X7-7.

Chapter 6 – System Supplies. This chapter presents a description of the DWP's current and projected water supply sources including information on the usage of groundwater, imported water and an overview of usage of recycled water. This chapter includes information on the DWP's future considerations of a recycled water system.

Chapter 7 – Water Supply Reliability. This chapter presents the reliability of the DWP's water supplies. This includes a discussion on future imported water reliability. In addition, there is an analysis of supply availability in a single dry year and in multiple dry years.

Chapter 8 – Water Shortage Contingency Plan. This chapter includes an urban water shortage contingency analysis that includes stages of action to be undertaken in the event of water supply shortages; a draft water shortage contingency resolution; prohibitions,

consumption reduction methods and penalties; an analysis of revenue and expenditure issues and measures to overcome these problems; actions to be taken during a catastrophic interruption of service; and a mechanism for measuring water use reduction.

Chapter 9 – Demand Management Measures. This chapter communicates DWP’s efforts to promote conservation and to reduce demand on their water supply specifically addressing several demand management measures and describing DMMs.

Chapter 10 – Plan Adoption, Submittal, and Implementation. This chapter describes the steps taken to adopt, submit, and implement the UWMP and make it publically available.

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Chapter 2

PLAN PREPARATION

This section includes specific information on how the UWMP was developed, including efforts in coordination and outreach.

2.1 BASIS FOR PREPARING A PLAN

The California Water Code requires urban water suppliers to prepare and adopt UWMPs for submission to the DWR. This plan was adopted on June 28, 2016.

10617 "Urban water supplier" means a supplier, either publicly, or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems...

2.1.1 Public Water Systems

California Health and Safety Code 116275 (h) "Public Water System" means a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year.

To demonstrate the basis of reporting, the Public Water Systems services by DWP are listed in Table 2.1. As listed in Table 2.1, the DWP served five public water systems with a total of 15,577 connections and a total of 2,095 afy in year 2015.

Table 2.1 Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015 (afy)
CA 3610044	Big Bear Lake/Moonridge	10,739	1,527
CA 3610022	Sugarloaf/Erwin Lake	3,993	455
CA 3610061	Fawnskin	720	73
CA 3600283	Lake William	124	25
CA 3600395	Big Bear Shores RV Park	1	15
TOTAL		15,577	2,095

2.2 INDIVIDUAL PLANNING

This UWMP reports solely on the DWP's service area, as shown in Table 2.2, addressing all the requirements of the CWC and will notify and coordinate with appropriate regional agencies and constituents.

Table 2.2 Plan Identification	
<input checked="" type="checkbox"/>	Individual UWMP
<input type="checkbox"/>	Regional UWMP (RUWMP)

2.3 CALENDAR YEAR AND UNITS OF MEASURE

<i>CWC 1608.20 (a) (1) Urban retail water suppliers...may determine the targets on a fiscal year or calendar year basis.</i>
--

The DWP is reporting on a calendar year basis and therefore, 2015 data includes the months of January to December 2015. The DWP's type of reporting year and the units of measure for reporting water volumes throughout the 2015 UWMP are indicated in Table 2.3.

Table 2.3 Agency Identification	
Type of Agency (select one or both)	
<input type="checkbox"/>	Agency is a wholesaler
<input checked="" type="checkbox"/>	Agency is a retailer
Fiscal or Calendar Year (select one)	
<input checked="" type="checkbox"/>	UWMP Tables Are in Calendar Years
<input type="checkbox"/>	UWMP Tables Are in Fiscal Years
Units of Measure Used in UWMP (select one)	
<input checked="" type="checkbox"/>	Acre Feet (AF)
<input type="checkbox"/>	Million Gallons (MG)
<input type="checkbox"/>	Hundred Cubic Feet (CCF)

2.4 COORDINATION AND OUTREACH

The UWMPA requires that the UWMP identify the water agency's coordination with appropriate nearby agencies.

2.4.1 Wholesale and Retail Coordination

Retail agencies that receive a water supply from one or more wholesalers are required to provide wholesalers with projected water demand from that source, in five-year increments for 20 years. Since the DWP is served solely by local groundwater, coordination with whole sale suppliers was not required as listed in Table 2.4.

Table 2.4	Retail: Water Supplier Information Exchange
The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.	
Wholesale Water Supplier Name	
N/A	

2.4.2 Coordination with Other Agencies and the Community

10620 (d)(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan...

While preparing the 2015 UWMP, the DWP coordinated its efforts with relevant agencies to confirm that the data and issues discussed in the plan were presented accurately. The coordination for the preparation of the 2015 UWMP is summarized in Table 2.5.

Table 2.5 Coordination with Appropriate Agencies

Coordinating Agencies	Notified of UWMP Update	Commented on the Draft	Attended Public Meetings	Was Sent a Copy of the Draft Plan	Not Involved/Not Informed
Big Bear Area Regional Wastewater Agency				X	
San Bernardino County	X			X	
Big Bear City Community Services District				X	
City of Big Bear Lake	X			X	
Big Bear Municipal Water District				X	

2.4.3 Notice to Cities and Counties

CWC 10621 (b) requires that agencies notify cities and counties to which they serve water that the DWP's UWMP is being updated and reviewed.

10621(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify a city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

The DWP provided formal written notification to the City of Big Bear Lake (City) and the County of San Bernardino (County) that the DWP's UWMP was being updated. In accordance with the UWMPA, this notification was provided at least 60 days prior to the public hearing of the plan. Electronic copies of the final UWMP will be provided to the City of Big Bear Lake, the County of San Bernardino, Big Bear Area Regional Wastewater Agency, Big Bear City Community Services District, and Big Bear Municipal Water District no later than 30 days after its submission to DWR. Appendix C contains copies of outreach documents.

Notices were published informing interested parties that the draft 2015 UWMP was available for review. Pursuant to California Code Section 6066, a notification of the time and place of the public hearing was published in the local newspaper on June 1, 2016 and June 8, 2016. A notice was also posted on DWP's website. Copies of these notifications are included in Appendix C.

The Final Draft 2015 UWMP was presented to the DWP's Board of Commissioners as a discussion item on May 31, 2016 for preliminary review and was presented again on June 28, 2016 for adoption by resolution following a public hearing. This hearing provided an opportunity for the DWP's customers, residents, and employees to learn and ask questions about the current and future water supply of the DWP. A copy of the associated documentation is included in Appendix C.

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Chapter 3

SYSTEM DESCRIPTION

The UWMPA requires that UWMPs include a description of the water supplier's service area and various aspects of the area served including climate and population.

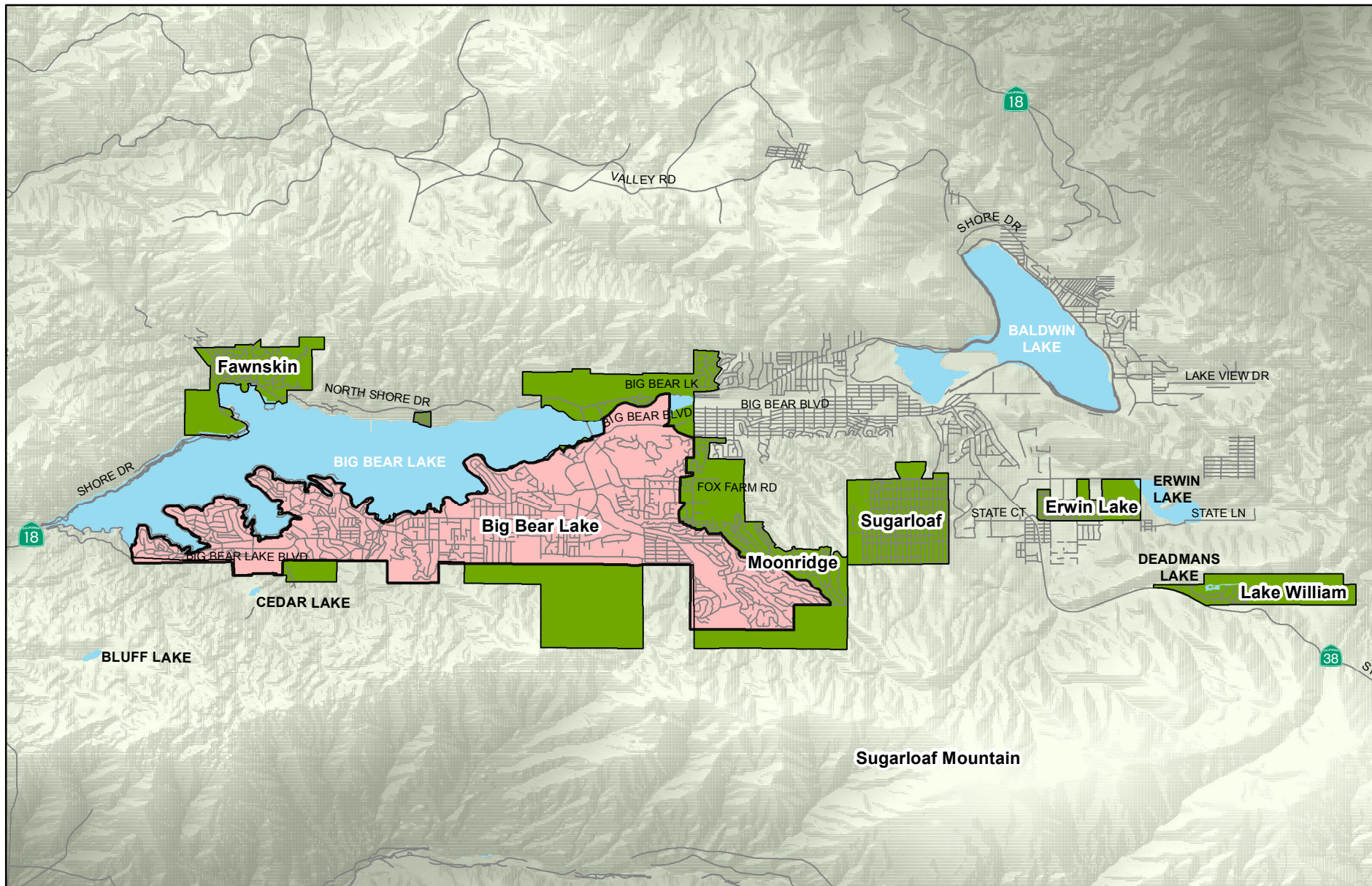
10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

10631. (a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

3.1 GENERAL DESCRIPTION

The DWP's water service area is located in Bear Valley (Valley) in the San Bernardino Mountains of San Bernardino County, California as depicted in Figure 3.1. Within the Valley, the DWP's service area is located primarily along the south shore of Big Bear Lake. Fawnskin lies to the north of the lake, and the Sugarloaf-Erwin Lake and Lake William systems are located east of the City. In total, the DWP's service area encompasses 5,970 acres, or approximately 9.3 square miles (CDM, 2006).

The DWP's service area is primarily residential. Recreation has been the most important economic factor in the Valley for nearly a century. Residential use composes 95 percent of the total service area. Commercial accounts make up approximately 5 percent and industrial accounts are less than 1 percent of total accounts (CDM, 2006).



Legend

- DWP Service Area within City
- Lakes
- DWP Service Area outside City
- Streets
- City of Big Bear Lake



Figure 3.1
Service Area Map
 2015 Urban Water
 Management Plan
 Big Bear Lake DWP



3.2 SERVICE AREA CLIMATE

The DWP's service area climate is a semi-arid, Mediterranean environment with cold winters, warm summers, and moderate rainfall. Average monthly evapotranspiration (ETo) rates, rainfall, and temperature are summarized in Table 3.1.

Table 3.1 Climate Characteristics					
Month	Standard Average Monthly ETo⁽¹⁾ (inches)	Average Monthly Precipitation⁽²⁾ (inches)	Average Monthly Temperature⁽³⁾ (°F)		
			Average	Minimum	Maximum
January	1.8	6.7	35.2	22.6	47.9
February	2.4	7.5	35.7	22.8	48.6
March	4.0	5.2	39.9	26.0	53.7
April	5.1	2.6	43.9	29.4	58.5
May	6.3	0.7	52.3	36.5	68.0
June	7.0	0.1	59.8	42.8	76.9
July	6.5	0.7	65.7	49.7	81.6
August	5.9	0.7	64.6	48.6	80.6
September	4.8	0.9	59.2	43.3	75.1
October	3.5	1.3	49.3	33.8	64.8
November	2.1	3.3	41.1	27.1	55.2
December	1.5	5.3	34.9	22.2	47.6
Annual	50.7	35.0	48.5	33.7	63.2
Notes: (1) Represents average monthly ETo and temperature from January 2010 to February 2016 at California Irrigation Management Information System (CIMIS) Station 199 – Big Bear Lake (CIMIS, 2016). (2) Precipitation Data represents monthly average from 1960 to 2015 provided by DWP staff. (3) Temperature Data retrieved from National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI) Big Bear Lake Station 40741 from January 1995 to February 2016 (NCEI, 2016).					

As shown in Table 3.1, the DWP service area's average monthly temperature ranges from about 35 to 66 degrees Fahrenheit (°F), with an average annual temperature of 49°F. Average annual values of ETo and precipitation are 51 inches and 35 inches, respectively. Records show that the average monthly precipitation ranges from 0.1 inches to 7.5 inches with most of the precipitation typically occurring from November through April.

3.3 SERVICE AREA POPULATION AND DEMOGRAPHICS

This section summarizes historical, current, and projected population trends in the DWP's service area. Population projections are essential to the planning process and form the basis for most planning decisions, yet projecting future growth is far from an exact science given the complex set of variables that can affect the rate of growth. Typically, projections are developed by taking past patterns and combining them with assumptions regarding the future to obtain an estimate of future growth rates. These projections serve to provide the DWP insight on the type and quantity of future growth as well as guidance regarding future planning activities; therefore, such planning activities can only be as effective as the ability to anticipate population growth.

The DWP's population is composed of full-time and temporary residents. The temporary population includes recreational visitors and second home-owners, and is assumed to primarily occur during the weekend and holidays. According to the DWP's 2010 UWMP, temporary visitors can increase to as much as 100,000 on peak days. Therefore, a distinction has been made between the full-time population and the average annual population, which also includes temporary population.

3.3.1 Historical Population

Historical population for years 1995 to 2010 was retrieved from the DWP's 2010 UWMP. Full-time service area population for years before 2010 was estimated by combining 2010 full-time residential population data with 2010 residential account data to create an account-to-population ratio. This ratio was combined with historical connection data to estimate historical full-time population data.

The methodology utilized in the 2010 UWMP to determine 2010 population was applied to determine the historical population between 2010 and year 2015. The DWP used Census data to determine the percentage of full-time households, average household size, and 2010 population. The 2010 Census data for the four different zip codes within the DWP's service area was utilized to determine the housing units, occupied homes, and population. To determine the percentage of permanent households, a ratio between the 2010 occupied homes and 2010 housing units was used, averaging to approximately 32 percent of all households within the DWP's service area. Average household size was determined by using a ratio between the 2010 Census population and the occupied homes, which equated to an average of approximately 2.39 people per household. To determine the 2015 population, full-time residential connections was determined to be 32 percent of all residential connections. The number of full-time residential connections was multiplied by the average of 2.39 people per household to yield a full-time service area population estimate of 11,382.

Given the influx of weekend and holiday visitors to the service area, it was estimated that the temporary population is 4 times the full-time population, or 45,527 for all weekends and

holidays throughout the year 2015 (totaling 114 days). Since full-time population is represented 365 days out of the year and the temporary population is assumed to be represented during all weekend and holidays (114 days out of the year), the average annual population in 2015 was estimated to be 25,601. The historical population is shown in Figure 3.2.

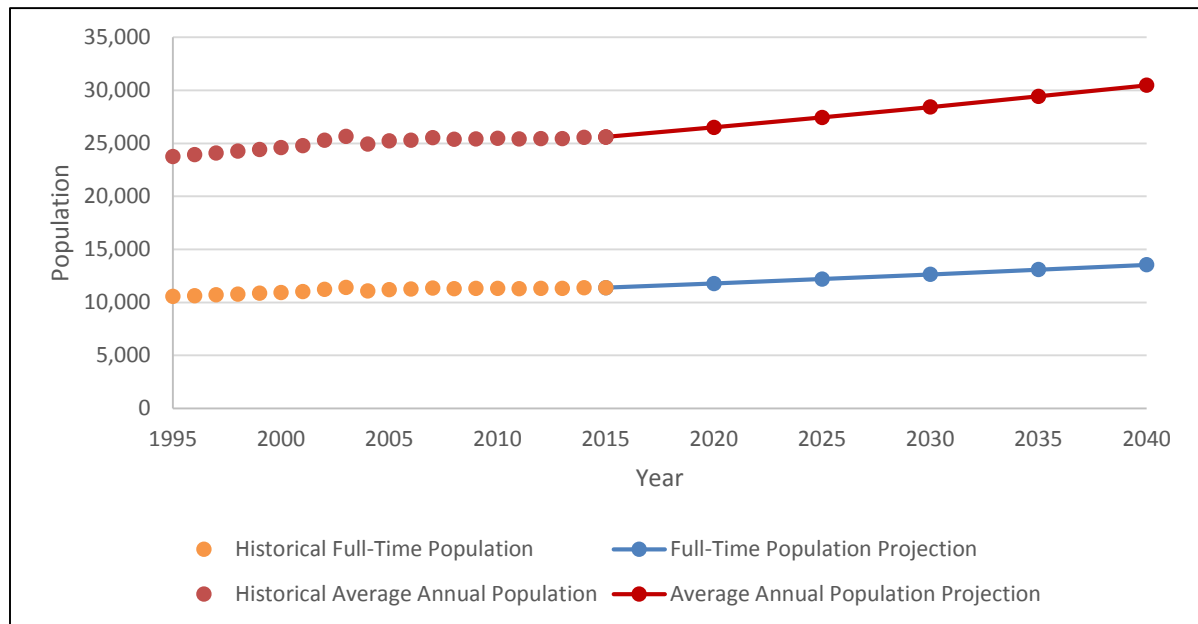


Figure 3.2 Full-Time and Average Annual Historical and Projected Population

As shown in Figure 3.2, the DWP's service area population has remained fairly steady between 1995 and 2015. The average annual population in 2015 is estimated at 25,601, while the full-time population is approximately 11,382, equivalent to 44 percent of the average annual population.

3.3.2 Future Population Projections

Since the DWP does not anticipate any major changes to the service area population, the same growth rate of 0.7 percent that was utilized for the 2010 UWMP was used in this 2015 UWMP to extend the population projection until year 2040. As mentioned previously, the temporary population was estimated to be four times the full-time population for all holidays and weekends (114 days out of the year). Estimated full-time and average annual population projections are listed in Table 3.2 and graphically presented in Figure 3.2. These population projections were used to forecast water requirements for the DWP through year 2040.

Table 3.2 Population - Current and Projected						
Population Served	2015	2020	2025	2030	2035	2040
Full-time Residents ^(1,2)	11,382	11,786	12,204	12,637	13,086	13,550
Average Temporary Population ⁽³⁾	14,219	14,724	15,247	15,788	16,348	16,928
Average Annual Population ⁽⁴⁾	25,601	26,510	27,451	28,425	29,434	30,479
Notes: (1) Based on 2010 Census, approximately 32% of the DWP's households are occupied and assumed to be permanent. (2) Assumed average household is 2.39 persons (Census 2010) year-round. (3) Temporary population assumed to equate to 4 times the full-time population during the holidays and weekends (114 days out of the year). (4) Assumes a 0.7% annual growth rate beginning in 2015. Rim Forest was removed from the DWP's service area effective 10/1/14 and is not included in projections.						

The DWP anticipates two significant developments in Fawnskin in the near future (by 2020). The Marina Point development, anticipated to come online in the summer of 2016, plans to include 11 ten-unit luxury condominiums, 10 lake front estates, and a club house. The Moon Camp development, anticipated to come online between 2018 and 2019, plans to include 50 half-acre lots with estate homes.

Based on the DWP service area's average of 2.39 people per household, the developments are anticipated to increase the population by 407 people. Assuming this increase is seen in the near-term (up to year 2020), the population increase from the developments contributes to about 0.3 percent per year of the projected average population up to year 2020. It is assumed that both developments are included in the 0.7 percent average increase per year. As shown in Table 3.2 and Figure 3.2, the DWP's service area average annual population is anticipated to grow by approximately 5,000 over the 25 years to roughly 30,500 in year 2040.

3.3.3 Other Demographic Factors

The DWP's population is composed of both permanent residents and temporary residents. Since the temporary population consists primarily of people visiting for recreational and vacation purposes, the population varies depending on the weather conditions.

Chapter 4

SYSTEM WATER USE

The UWMPA requires that the UWMP identify the quantity of water supplied to the agency's customers including a breakdown by user classification. This section describes the water system demands and water demand projections.

4.1 RECYCLED VERSUS POTABLE AND RAW WATER DEMAND

This Chapter covers potable and raw water demand. Recycled water is addressed in Chapter 6.

4.2 WATER USES BY SECTOR

CWC 10631(e)(1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors...

Water demands served by the DWP are primarily residential with some commercial usage. All connections in the DWP's service area are metered. The actual demands for potable and raw water are presented in Table 4.1 for the 2015 calendar year. As shown in Table 4.1, residential demands account for 1,394 afy or approximately 67 percent of the DWP's total demand, while commercial demands account for 458 afy or approximately 22 percent of the DWP's total demand. The remaining 11 percent is attributed to unbilled consumption and water loss.

Table 4.1 Retail: Demands for Potable and Raw Water - Actual			
Use Type	2015 Actual		
	Additional Description	Level of Treatment When Delivered	Volume (afy)
Other	All Residential	Drinking Water	1,394
Commercial	N/A	Drinking Water	458
Losses	N/A	Drinking Water	212
Other	Unbilled Consumption	Drinking Water	31
TOTAL			2,095

Since the DWP is meeting their 2020 SB X7-7 goal, which is discussed further in Chapter 5, the per capita demand is projected to remain steady. Thus, the projected water demands were assumed to grow consistently with the projected number of residents at an average of 0.7 percent increase per year. The projected water use for each customer sector is listed in Table 4.2.

Table 4.2 Retail: Demands for Potable and Raw Water - Projected						
Use Type	Additional Description	Projected Water Use¹ (afy)				
		2020	2025	2030	2035	2040
Other	All Residential	1,443	1,495	1,548	1,603	1,660
Commercial	N/A	474	491	509	527	545
Losses	N/A	220	227	235	244	252
Other	Unbilled Consumption	32	33	34	35	36
TOTAL		2,169	2,246	2,326	2,408	2,494
Note: (1) Assumed an increase of 0.7% per year.						

As shown in Table 4.2, the water demand is anticipated to increase nearly 400 afy to 2,494 afy by year 2040. The DWP's total water demands for potable and raw water, and recycled water demand, based on the figures presented in Table 4.1, Table 4.2, and Table 6.4, are summarized in Table 4.3.

Table 4.3 Retail: Total Water Demands (afy)						
Year	2015	2020	2025	2030	2035	2040
Potable and Raw Water ⁽¹⁾	2,095	2,169	2,246	2,326	2,408	2,494
Recycled Water Demand ⁽²⁾	0	0	0	0	0	0
TOTAL WATER DEMAND	2,095	2,169	2,246	2,326	2,408	2,494
Notes: (1) Potable water demands assume a 0.7% increase (2) Recycled water demands have not yet been established.						

As shown in Table 4.3 and discussed later in Chapter 6, the recycled water demand projections are not included in this UWMP. Though the DWP does have a planned recycled water project for future uses, the project is still in preliminary stages and recycled water demand projections have not yet been developed. For conservative planning purposes, the future recycled water demand is assumed to be zero afy.

4.3 DISTRIBUTION SYSTEM WATER LOSSES

CWC 10631(e)(1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:

(J) Distribution system water loss

(3)(A) For the 2015 urban water management plan update, the distribution system water loss shall be quantified for the most recent 12-month period available.

Distribution system water losses ("real" losses) are the physical water losses from the water distribution system and the supplier's storage facilities, up to the point of customer consumption. The distribution system water loss for the most recent 12-month period available (2015 calendar year) is reported in Table 4.4.

Table 4.4 Retail: Water Loss Summary Most Recent 12 Month Period Available	
Reporting Period Start Date (Month/Year)	Loss (afy)
Jan/2015	212
Note: (1) Refer to AWWA water audit in Appendix D for more details on calculation.	

As shown in Table 4.4 and reported in the American Water Works Association (AWWA) water audit (see Appendix D), the DWP has approximately 212 afy of water loss (10 percent).

4.4 ESTIMATING FUTURE WATER SAVINGS

"Passive" savings are water savings from codes, standards, ordinances, or transportation and land use plans. As shown in Table 4.5, future water savings are not included in the total water use projections (Table 4.2).

Table 4.5 Retail Only: Inclusion in Water Use Projections	
Future Water Savings Included Y/N	No
If "Yes" to above, state the section or page number where citations of the codes, ordinances, etc. utilized in demand projections are found.	N/A
Lower Income Residential Demands Included	No

4.5 WATER USE FOR LOWER INCOME HOUSEHOLDS

The UWMPA requires that the UWMP identify planned low-income housing developments within the agency's service area and develop demand projections for those units. A lower income household is defined as one with an income below 80 percent of area median income, adjusted for family size.

10631.1(a). The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

The City of Big Bear Lake's General Plan (GP, 2013) provides information on Regional Housing Needs Allocation progress (RHNA). The Housing Element of the General Plan identified the need to construct 1 extremely low-income and 1 very low-income housing unit between 2013 and 2018.

The 2013 General Plan Update did not provide information on single-family versus multi-family low income dwelling units, so the average number of people per dwelling unit was assumed to be the same as the rest of the City at 2.3 people per dwelling unit. Assuming that these two dwelling units reflect an average of 2.3 people per dwelling unit and the projected per capita water usage of 73 gpcd, the total demand associated with low-income housing is estimated to be 0.37 afy. Since the General Plan does not indicate any additional need for low-income housing beyond year 2018, the projected demand after 2020 is assumed to remain constant through year 2040. Projected water demands from the low-income housing are summarized in Table 4.6.

Table 4.6 Low-Income Projected Water Demands					
Description	Water Demands (afy)				
Year	2020	2025	2030	2035	2040
Low Income Housing ¹	0.37	0.37	0.37	0.37	0.37
<u>Note:</u>					
(1) Assumed two low-income housing units and an average of 2.3 people per dwelling unit.					

Chapter 5

SB X7-7 BASELINES AND TARGETS

The UWMPA requires that the UWMP identify the baseline water demand, urban water use target, and interim urban water use target for the DWP.

10608.20. (g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).

The daily per capita water use, expressed in gallons per capita per day (gpcd), is the total water use within the service area divided by the population. The baseline daily per capita use is the first step in determining the DWP's various urban water use targets over the 25-year planning horizon. The average per capita use sets the "baseline" on which the urban and interim compliance year (year 2015) water use targets are determined. These targets are necessary to judge compliance with the 2020 use reductions set forth in the Water Conservation Bill of 2009.

5.1 BASELINE PERIODS

The first step in developing the baseline water use for the DWP is determining the applicable range and years for which the baseline average will be calculated. The UWMPA stipulates an agency may use either a 10 or 15-year average to determine its baseline. If 10 percent of total water deliveries in 2008 were from recycled water, then the agency can use a 15-year average baseline. Since the DWP's recycled water deliveries in 2008 were not greater than 10 percent of the total water deliveries, a 10-year average, ranging from year 1995 to 2004, was used for baseline determination.

In addition to the 10-year baseline, a 5-year baseline, ranging from year 2003 and 2007, was also calculated, which is used to establish the minimum criteria for the DWP's use reduction targets. The baseline period ranges are detailed in Table 1 of the SB X7-7 Tables (Appendix B).

5.2 SERVICE AREA POPULATION

10608.20. (e) An urban retail water supplier shall include in its urban water management plan due in 2010... the baseline per capita water use,...along with the bases for determining those estimates, including references to supporting data.
(f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.

10644. (a)(2) The plan... shall include any standardized forms, tables or displays specified by the department.

As mentioned in Chapter 3, the DWP's population is unique in that it is composed of permanent full-time residents and temporary residents. Starting October 2014, Rimforest was removed from the DWP's service area and is no longer part of the DWP's system. Since the 2010 UWMP utilized the 2010 U.S. Census data for the methodology described in Chapter 3, adjustments were not made for historical population for the 2015 UWMP with the exception of the removal of Rimforest as discussed in Section 5.4. The DWP's population for the baseline years and the compliance year are summarized in Table 3 of the SB X7-7 Tables in Appendix B. The estimated average population for DWP's service area of the compliance year, year 2015, is 25,601.

5.3 GROSS WATER USE

10608.12 (g) "Gross Water Use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:

- (1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier
- (2) The net volume of water that the urban retail water supplier places into long term storage
- (3) The volume of water the urban retail water supplier conveys for use by another urban water supplier
- (4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.

Gross Water Use is the total volume of water, treated or untreated, supplied to the distribution system over 12 months. Since the DWP routinely delivers water to other suppliers during emergency scenarios (CSD) and does not use recycled water or serve industrial customers, the Gross Water Use for the DWP's service area includes production at all well sites for each calendar year. Gross water use is reported for each year with the removal of Rimforest in the baseline periods, as well as 2015, which is listed in Table 4 of the SB X7-7 Tables in Appendix B. The gross water use for the compliance year, year 2015, is approximately 2,095 afy.

5.4 BASELINE DAILY PER CAPITA WATER USE

Since the DWP terminated delivery to Rimforest in 2014, the baseline daily per capita water use was adjusted to remove the population and demand from Rimforest for all baseline years. In 2013, the Census estimated Rimforest population to have a population of approximately 186 people, comprising less than 1 percent of the DWP's average 2013 population. Since Rimforest was only a small portion of the DWP's population and demand, the 10-year baseline daily per capita water use of 101 gpcd remained the same. The 5-year baseline daily per capita water use reduced from 92 gpcd in the 2010 UWMP to 91 gpcd. The baseline per capita water use is calculated and summarized in the SB X7-7 Tables 5 and 6 (Appendix B), respectively.

5.5 2015 AND 2020 TARGETS

The UWMPA requires urban water suppliers to determine the interim and urban water use targets for 2015 and 2020, respectively. Utilizing the methods described in Section 5.5.1, the 2015 and 2020 targets are 121 gpcd and 142 gpcd, respectively. The targets are summarized in SB X7-7 Table 8 (Appendix B).

5.5.1 Target Method and Target Confirmation

10608.22. Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as defined in paragraph (3) of subdivisions (b) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.

SB X7-7 requires that all water suppliers increase water use efficiency by decreasing per capita consumption by 20 percent by year 2020. The DWR provided four different methods to establish water conservation targets in the 2010 UWMP.

The baseline years used in the 2010 UWMP were also used in this UWMP. Since Rimforest was a small portion of the DWP's service area, the removal of Rimforest did not have a large impact on the 10-year and 5-year baseline calculations summarized in SB X7-7 Table 5 (Appendix B). The average per capita consumption during this 10-year baseline period was 101 gpcd, while the per capita consumption of the 5-year baseline period, 2003 to 2007, was reduced to 91 gpcd.

The 2010 UWMP utilized Method 3, which remains the recommended method in this UWMP. The State's 20 by 2020 water conservation plan has identified specific urban water use targets for 2015 and 2020 for each of the ten hydrologic regions shown in Figure 5.1. To determine the target using Method 3, 95 percent of the region-specific conservation goal is calculated. Based on a regional target of 149 gpcd for the Hydrologic Region 4 (South Coast), the Method 3 target is 142 gpcd for year 2020.

The maximum per capita consumption for year 2020 is defined as 95 percent of the 5-year gpcd, which establishes a maximum water conservation target of 86 gpcd. However, if the 5-year baseline daily per capita use falls below 100 gpcd, no adjustment to the water use target is needed. Therefore, in accordance with CWC 10608.22, the targets are reported as follows:

The DWP's Method 3 targets are as follows:

- Year 2015 Target: 121 gpcd
- Year 2020 Target: 142 gpcd

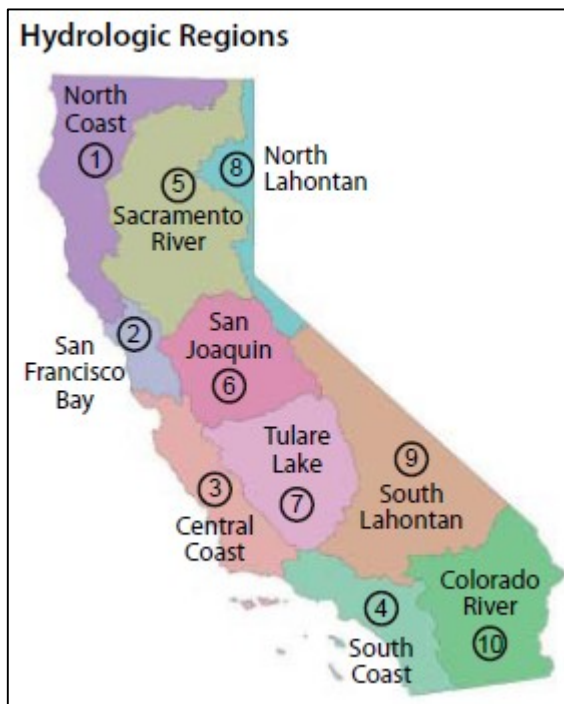


Figure 5.1 Hydrologic Regions

The 2015 Interim Target is the value halfway between the 10-year baseline gpcd (101 gpcd) and the confirmed 2020 target (142 gpcd). The Interim 2015 target for the DWP is 121.

5.5.1 Baselines and Targets Summary

Based on the water use targets calculated above, Method 3 was selected, which resulted in a water use target for 2020 of 142 gpcd and a 2015 interim water use target of 121 gpcd.

According to CWC 10608.22, the 2020 target is valid since the DWP's 5-year baseline is less than 100 gpcd. A summary of the baselines and the corrected water use targets are summarized in Table 5.1.

Table 5.1 Baselines and Targets Summary					
Baseline Period	Start Years	End Years	Average GPCD	2015 Interim Target¹	Confirmed 2020 Target¹
10-15 year	1995	2004	101	121	142
5 Year	2003	2007	91	N/A	N/A

As shown in Table 5.1, the calculated interim target for 2015 is 121 gpcd, while the 2020 target is 142 gpcd.

5.6 COMPLIANCE DAILY PER CAPITA WATER USE

10608.12(e) "Compliance daily per-capita water use" means the gross water use during the final year of the reporting period...

10608.24(a) Each urban retail water supplier shall meet its interim urban water use target by December 31,2015.

10608.20 (e) An urban retail water supplier shall include in its urban water management plan due in 2010... compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

Water suppliers are required to calculate their actual 2015 water use (2015 calendar year) and evaluate whether their per capita 2015 target use was met and assess progress towards achieving their 2020 target water use. The DWP determined its 10-year baseline water use and urban water use targets in accordance with the methods described in the DWR 2015 UWMP Guidebook. The calculated interim target and the actual year 2015 per capita water use are summarized in Table 5.2.

Table 5.2 2015 Compliance							
2015 Actual GPCD	2015 Interim Target ¹ (gpcd)	Optional Adjustments to 2015 GPCD <i>From Methodology 8</i>				Actual (or Adjusted Actual) as Percent of Target	In Compliance? Y/N
		Extraordinary Events	Economic Adjustment	Weather Normalization	Adjusted Actual 2015 GPCD		
73	121	0	0	0	0	60%	Yes

As shown in Table 5.2, the DWP met the interim target of 121 gpcd and the 2020 target of 142 gpcd in year 2015. If the DWP can maintain water consumption rates, it will exceed 2020 conservation goals.

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Chapter 6

SYSTEM SUPPLIES

The UWMPA requires that the UWMP include a description of the agency's existing and future water supply sources for the next 20 years. The description of water supplies must include detailed information on surface water, groundwater, the groundwater basin, potential opportunities for desalination of groundwater and seawater, and detailed information on the agency's imported water.

6.1 PURCHASED OR IMPORTED WATER

The DWP does not currently use surface or imported water to meet its water demand. Up until September 2014, the DWP served the Rimforest area by imported water delivered from the Crestline Lake Arrowhead Water Agency (CLAWA). This area is geographically separate from Bear Valley and receives water from CLAWA. Previously, Rimforest annual demand accounted for approximately 2 percent of DWP's total annual demand. Since Rimforest is no longer in the DWP's service area, the DWP does not currently use imported water.

DWP also has interconnections with Big Bear City Community Services District (BBCCSD) in order to transfer water in the event of an emergency shortage. These connections are for temporary emergency supplies only and are therefore not factored into demand projections.

6.2 GROUNDWATER

Groundwater underlying the DWP's service area is of good quality and requires little treatment before use in the potable water supply system. The maximum perennial yield for the Bear Valley groundwater basin has been estimated at 4,800 afy with approximately 3,100 afy of that volume being available to the DWP (CDM, 2006).

6.2.1 Groundwater Basin Description

10631 (b) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:
(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater.

Bear Valley lies in the northeastern portion of the Santa Ana River Watershed. The Bear Valley groundwater basin (Basin) is primarily composed of alluvium and the main tributaries include Rathbun Creek, Grout Creek, Van Dusen Canyon, Sawmill Canyon, Sand Canyon, Knickerbocker Creek, Metcalf Creek, and North Creek. Based on the drainage system, Bear Valley is divided into 16 hydrologic subunits (LCA, 1987 a & b). Details on the Basin can be found in California's Groundwater bulletin 118, which can be found in Appendix E.

The water bearing deposits within the Valley have been divided into upper, middle, and lower aquifers. The upper and middle aquifers are the primary water-producing formations. The upper aquifer extends through the eastern part of the Basin where it reaches more than 200 feet thick, but is thin and unsaturated in the western portion of the Basin. The middle aquifer is found throughout the Basin and ranges from 150 to more than 800 feet thick (DWR, 2004).

Basin recharge is from percolation of precipitation and runoff, as well as underflow from fractured rock formations. Groundwater levels generally correlate with annual fluctuations of precipitation.

Total storage capacity of the Basin is estimated at 42,000 af. Average inflow is 6,240 afy and main losses to the basin are outflow and pumping (DWR, 2004).

6.2.2 Groundwater Management

10631 (b) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:
(1) A copy of any groundwater management plan adopted by the urban water supplier... or any other specific authorization for groundwater management.

Based on input from DWP staff, the Basin is not an adjudicated basin and is well managed with no water rights issues. The DWP is part of the California Statewide Groundwater Elevation Monitoring (CASGEM) program and provides monthly monitoring data to the State. Based on the DWP's groundwater monitoring data, the Basin has maintained a steady depth. Reports for the various hydrologic subunits as of March 31, 2016 are attached in Appendix E.

6.2.3 Overdraft Conditions

10631 (b)(2) For basins that have not been adjudicated, (provide) information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

While the Village subunit was overdrafted in previous years, it has since recovered (CDM, 2005). Since the DWP's production was approximately 3,014 afy in 2002, nearing the aquifer estimated perennial yield of 3,100 afy, the DWP began a comprehensive conservation program. Over the last five years, the DWP's production has averaged 2,228 afy. At present, no subunit within the Bear Valley groundwater basin is known to be in overdraft.

6.2.4 Historical Groundwater Pumping

10631 (b) ...If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:
(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

The DWP uses 53 wells to extract water from the Basin. Of these wells, 24 are slant wells and 29 are typical pump powered vertical wells. The DWP's groundwater supply is summarized in Table 6.1.

Table 6.1 Retail: Groundwater Volume Pumped (afy)						
Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	Bear Valley Basin	2,156	2,235	2,424	2,215	2,095
Total		2,156	2,235	2,424	2,215	2,095
Note: (1) Source: Groundwater Volume based on water superintendent reports from calendar years 2011 through 2015.						

As shown in Table 6.1, the annual volume of groundwater pumped for the most recent 5 years are below the perennial yield of 3,100 afy. Since the 2010 UWMP, annual use of the groundwater has reached a maximum of 2,424 afy in 2013, but has decreased to approximately 2,095 afy in 2015. This decrease is likely due to conservation efforts.

6.3 SURFACE WATER

The DWP does not currently use surface water to meet its water demand.

6.4 STORMWATER

The DWP has not identified any opportunities related to stormwater recapture to offset potable water use.

6.5 WASTEWATER AND RECYCLED WATER

The UWMPA requires that the UWMP address the opportunities for development of recycled water, including the description of existing recycled water applications, quantities of wastewater currently being treated to recycled water standards, limitations on the use of available recycled water, an estimate of projected recycled water use, the feasibility of said projected uses, and practices to encourage the use of recycled water.

6.5.1 Recycled Water Coordination

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.

In 2015, the Big Bear Area Regional Wastewater Authority (BBARWA), Big Bear Municipal Water Department (MWD), BBCCSD, and the DWP teamed up to develop a Facilities Plan for the Bear Valley Water Sustainability Project (BVWSP). As part of the BVWSP, a proposed advanced treatment system at the existing wastewater treatment plant (WWTP) followed by a constructed wetland is expected to produce high quality water for irrigation, environmental, commercial, and construction users as a potable water offset (BBARWA, 2015).

6.5.2 Wastewater Collection, Treatment, and Disposal

10633. (a) (Describe) the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

Wastewater collection systems within the service area for the DWP are operated by the City, BBCCSD, and the County of San Bernardino County Service Area 53B (CSA 53B). The collection systems deliver wastewater to BBARWA's interceptor system.

BBARWA was formed in March 1974 and its service area includes the entire 79,000 acres of Bear Valley. It is served by three collection systems maintained by the individual member agencies, which include the City, BBCCSD, and CSA 53B. BBARWA operates three main lines; the low pressure sewer force main that services the City's wastewater system, the North Shore Interceptor that services the county's wastewater system, and the BBARWA Trunk Line that services the BBCCSD's wastewater system and conveys flow from the North Shore Interceptor to the treatment plant. Wastewater flows from the three main lines is conveyed to the BBARWA WWTP located on a 94-acre parcel near Baldwin Lake in Big Bear City (ER, 2010). The plant occupies about 11.2 acres, leaving 82.3 acres for evaporation ponds and other purposes. The plant has a peak hydraulic capacity of 9.1 million gallons per day (mgd), a secondary wastewater treatment capacity of 4.9 mgd and, as of 2010, operated at about 2.5 mgd (ER, 2010).

The 2015 wastewater flows from the DWP's service area is summarized in Table 6.2. As shown in Table 6.2, the DWP contributed nearly 1,000 afy of wastewater flow into the BBARWA WWTP in 2015.

6.5.3 Wastewater Treatment and Discharge within Service Area

As shown in Table 6.3, wastewater is not disposed of in the DWP's service area. Currently, BBARWA discharges the secondary wastewater treatment plant effluent to a 480-acre site in Lucerne Valley where it is used to irrigate feed crops. The sludge is collected, dewatered, and hauled to disposal facilities. BBARWA is permitted to discharge treated wastewater for irrigation, construction compaction, dust control, and wildland firefighting in the Valley (CDM, 2005).

Table 6.2Retail: Wastewater Collected Within Service Area in 2015						
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected in 2015	Receiving Wastewater Treatment			
			Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party?
BBARWA	Metered	997	BBARWA	BBARWA WWTP	No	N/A
Total Wastewater Collected from Service Area in 2015:		997				
Notes: (1) Volume of wastewater collected based on BBARWA flow reports (BBARWA, 2016).						

Table 6.3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015	
<input checked="" type="checkbox"/>	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.

6.5.4 Recycled Water System

Currently, there is no recycled water system available in the DWP's service area.

6.5.5 Recycled Water Beneficial Uses

6.5.5.1 Current and Planned Uses of Recycled Water

The DWP currently does not utilize recycled water. As mentioned in Section 6.5.1, the DWP is currently working with BBARWA, BBCCSD, and MWD in developing a Facilities Plan for the BVWSP. BBARWA is the lead agency in the project. As part of the BVWSP, a proposed advanced treatment system at the existing WWTP followed by a constructed wetland is expected to produce high quality water for irrigation, environmental, commercial, and construction users as a potable water offset (BBARWA, 2015). The Facilities Plan for the project is estimated to be completed in July 2016.

Currently, BBARWA treats the Valley's wastewater to secondary standards and exports approximately 2,000 afy to Lucerne Valley to irrigate an alfalfa field. The proposed plan will retain this treated water within the Valley as a local supply to serve as a potable offset. The DWP plans to utilize the treated water for irrigation and construction. Since the project is currently in its preliminary stages, details on projected supply allocations to DWP and future demands were not available at the time of writing this UWMP.

Since the project is in its preliminary stages of planning, projected recycled water beneficial uses have not yet been determined. Thus Table 6.4 is not applicable to this 2015 UWMP.

Table 6.4 Current and Projected Recycled Water Direct Beneficial Uses Within Service Area	
<input checked="" type="checkbox"/>	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.

6.5.5.2 Planned Versus Actual Use of Recycled Water

The 2010 UWMP did not project any recycled water use in 2015. Thus, the DWR standardized Table 6.5, which compares the 2010 projections for 2015 to the actual use in 2015, is not applicable for the DWP.

Table 6.5 Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual	
<input checked="" type="checkbox"/>	Recycled water was not used in 2010 nor projected for use in 2015. The supplier will not complete the table below.

6.5.6 Actions to Encourage Recycled Water Use

The DWP does not currently have recycled water within its service area. Given the geography of the DWP's service area, it is not practical to connect to other existing recycled water systems. As mentioned, the DWP is working with other neighboring agencies in developing the BVWSP. If completed, the DWP may utilize the recycled water for groundwater recharge. According to the 2010 UWMP, the DWP also analyzed the potential of utilizing recycled water for water recharge, snowmaking, and golf course irrigation.

Since recycled water allocations from the proposed facility have not yet been determined, expected recycled water use has not been calculated and actions to encourage recycled water use have not been determined as listed in Table 6.6.

Table 6.6 Retail: Methods to Expand Future Recycled Water Use			
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
N/A	N/A	N/A	N/A
Total			0
Note: (1) Recycled water project is in its preliminary stages and has not determined methods to expand.			

6.6 DESALINATED WATER OPPORTUNITIES

10631(d). Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

No opportunities exist for development of desalinated water by the DWP. Participation in a ocean water desalination plant would be cost prohibitive as the DWP is located approximately 90 miles inland and located at 6,750 feet above sea level.

6.7 EXCHANGES OR TRANSFERS

10631(d). Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

6.7.1 Exchanges

Water exchanges entail water being delivered by one water user to another water user, with the receiving water user providing water in return at a specified time or when the conditions of the parties' agreements are met. The DWP does not have any existing or planned water exchanges.

6.7.2 Transfers

Water transfers entail a temporary or long-term change in the point of diversion, place of use, or purpose of use due to a transfer, sale, lease, or exchange of water or water rights. The DWP does not currently have any existing or new transfer opportunities identified.

6.7.3 Emergency Interties

The DWP currently has two emergency supply interconnections with the BBCCSD system, which supplies water to unincorporated areas of Big Bear City and the eastern portion of the Valley. These interconnections are for emergencies that disrupt the DWP's or the BBCCSD's ability to serve their customers. The interconnections are intended to be used until either agency declares water exchanges are no longer necessary.

There are no set agreements between the BBCCSD and DWP for limits on the quantity of water that could be transferred. Each transfer would be evaluated on a case-by-case basis but in no way would be allowed to affect the transferring agency's ability to supply their customers' needs (CDM, 2005).

6.8 FUTURE WATER PROJECTS

10631(g)... The urban water supplier shall include a detailed description of expected future projects and programs... that the urban water supplier may implement to increase the amount of water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

The Sawmill Well Pumping Plant is currently under design with an anticipated construction completion in year 2017. This project will serve as DWP's second largest producer at 350 gpm or 564 afy and pump to the recently constructed Angels Camp Reservoir. Expected future projects and programs are summarized in Table 6.7.

Table 6.7 Retail: Expected Future Water Supply Projects or Programs						
Name of Future Projects or Programs	Joint Project with other agencies?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Agency
Sawmill Well Pumping Plant	No	N/A	Pump into Angels Camp Reservoir	2017	Average Year	564

6.9 SUMMARY OF EXISTING AND PLANNED SOURCES OF WATER

The actual source and volume of water for the year 2015 is presented in Table 6.8. As shown in Table 6.8, the DWP's actual supply was approximately 2,095 afy, which is below the Basin's safe yield of 3,100 afy.

Table 6.8 Retail: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2015		
		Actual Volume (afy)	Water Quality	Total Right or Safe Yield (afy)
Groundwater	Bear Valley Basin	2,095	Drinking Water	3,100
Total	N/A	2,095	N/A	3,100

The projected water supply in 5-year increments is included in Table 6.9. For the DWP, the available water supply is projected based on estimated future demands, which are below the safe yield of the Basin.

6.10 CLIMATE CHANGE IMPACTS TO SUPPLY

The CWC does not require that UWMPs address climate change. The potential water supply effects related to climate change are discussed briefly in this section.

Because the DWP is 100 percent reliant on groundwater for its potable water supply, the effects of climate change are best summarized by considering the effects of the region as a whole. These effects will likely include:

- Reduction in snowpack, which is a significant source of water as it melts and feeds aquifers in the San Bernardino Mountains
- Increase in intensity and frequency of extreme weather events
- Effects on groundwater recharge during droughts
- General decline in ecosystem health and function
- Changes to demand levels and patterns due to increasing temperatures

As scientific understanding of climate change continues to advance, the nature of these impacts and the impact on water supply availability and reliability will be thoroughly studied to identify proper mitigation and adaptation strategies.

Table 6.9 Retail: Water Supplies — Projected											
Water Supply	Additional Detail on Water Supply	Projected Water Supply (afy)									
		2020		2025		2030		2035		2040	
		Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield
Groundwater	Bear Valley Basin	2,170	3,100	2,247	3,100	2,326	3,100	2,409	3,100	2,494	3,100
Total		2,170	3,100	2,247	3,100	2,326	3,100	2,409	3,100	2,494	3,100
Notes: (1) Groundwater projected water supply is based on estimated future demands since it is less than the safe yield of 3,100 afy. (2) Recycled Water projections have not yet been determined and are not included in these projections.											

Chapter 7

WATER SUPPLY RELIABILITY

UWMPs are required to address the reliability of the agency's water supply, seasonal and long-term supply vulnerability, and the effect of water quality on supply. Finally, vulnerabilities for a single-dry year and in multiple-dry years must be addressed.

10631 (c)(2) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631 and the manner in which water quality affects management strategies and supply reliability.

7.1 CONSTRAINTS ON WATER SOURCES

Two aspects of supply reliability were considered. The first relates to real-time demand and is primarily a function of the adequacy of the supply. The second aspect is climate-related, and involves the availability of water during drought periods.

There are a variety of factors that can affect water supply reliability. The factors that might result in supply reliability issues for the DWP include water quality and climactic changes.

7.1.1 Water Quality

The water quality within the Basin is generally good. The eastern part of the Basin is characterized by elevated fluoride. Other problem constituents include manganese, uranium, and arsenic. Water quality issues have resulted in occasional blending projects, water treatment plants, and wells being shut down. However, water quality issues are not anticipated to disrupt groundwater supply (DWR, 2004). Annual Consumer Confidence Reports (CCR) for the DWP's service area in year 2015 can be found in Appendix F.

7.1.2 Climate

While reliable climate change forecasts are not available for the San Bernardino Mountains, climate change is likely to add uncertainties to supply planning and future supply availability. The severe and prolonged drought that began in 2012 has been a test of the DWP's ability to prepare for, and adapt to, the effects of climate change. Considering reductions in per capita use and projected demands below the safe perennial yield, the DWP continues to balance a cautious optimism with a long term strategy for sustainable sources of supply.

7.1.3 Potential Alternative Sources

Since all of the DWP's current and future water supply is groundwater with a current estimate of perennial yield available to the DWP of 3,100 afy, the DWP has identified and evaluated alternative water sources for its service area and determined that some local options have yet to be explored. Sixteen alternative water sources were evaluated in the *Reconnaissance Analysis of Alternative Water Sources* document (see Appendix E). The alternative sources were evaluated by potential volume supplied, capital costs, operations and maintenance costs, technical feasibility, and political feasibility.

Based on the study, four alternatives will be focused on in the next 10 to 20 years:

- Maximizing extraction from each hydrologic subunit.
- Enhance groundwater recharge.

A list of all potential projects investigated by the DWP can be found in Appendix E.

7.2 RELIABILITY BY TYPE OF YEAR

10631 (c)(1) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following: (A) an average water year, (B) a single dry water year, (C) multiple dry water years.

This section compares water supply and demand for three scenarios: normal year, single-dry year, and multiple-dry years.

- **Average Year:**
An average year is a year in the historical sequence that most closely represents median precipitation levels and patterns. Water supply quantities for this condition are represented by historical average yields.
- **Single-Dry Year:**
This is defined as a year with minimum useable supply. The supply for this condition is derived by the minimum historical annual yield.
- **Multiple-Dry Years:**
This is defined as the three consecutive years with the minimum useable supply. Water systems are more vulnerable to droughts of long duration, which deplete water supply reserves. The supply for this condition is defined from the minimum, recorded historical three year supply.

7.2.1 Methodology

In the event of single and multiple dry years, reduced rainfall results in lower groundwater recharge. However, aquifers contain more water in storage than the perennial yield. Thus, water remains available. The DWR estimates total storage of the Basin at approximately 42,000 acre-feet. Provided annual pumping does not exceed safe yield, the groundwater

basin will continue to contain sufficient water during multiple dry-year conditions.

The DWP's system has an instantaneous pumping capacity of roughly 4,800 gallons per minute (gpm) with approximately 500 gpm of this capacity from slant wells. During droughts, water production from slant wells will decline, requiring vertical wells to make up lost production. In addition, the DWP is constructing the Sawmill Well Pumping Plant, which will increase pumping capacity to approximately 565 afy (or 350 gpm).

Due to the estimated 42,000 acre-feet of storage capacity in the Basin and proper groundwater management, there should be sufficient groundwater to meet future supply needs. Based on the current water table, the groundwater levels have remained steady in comparison to the last drought on record. The groundwater basin is being monitored on a monthly basis. For reference, the monthly data is located in Appendix E. Based on the data, the groundwater basin is still showing signs of recovery and recharge during the drought.

7.2.2 Basis of Water Year Data

The specific years identified for average, single-dry, and multiple-dry water years are presented in Table 7.1, as well as the actual water supply for each year. The assumptions that underlie the calculations of supply and demand are based on historical demand data.

Table 7.1 Retail: Bases of Water Year Data		
Year Type	Base Year	Volume Available ¹ (afy)
Average Year	2003	2,655
Single-Dry Year	2013	2,484
Multiple-Dry Years 1st Year	2012	2,291
Multiple-Dry Years 2nd Year	2013	2,484
Multiple-Dry Years 3rd Year	2014	2,249
Note: (1) Volume available is based on production data for each year.		

To determine the average demand year, the DWP's historical per capita water usage was evaluated. By normalizing water consumption with population and thus expressing consumption in gpcd, differences in demand due to growth were eliminated. The historical per capita consumption from the period 1995 to 2015 is shown in Figure 7.1. The average consumption during this period was 92 gpcd. Since 2003 per capita demand was also 92 gpcd, this year represents an average year.

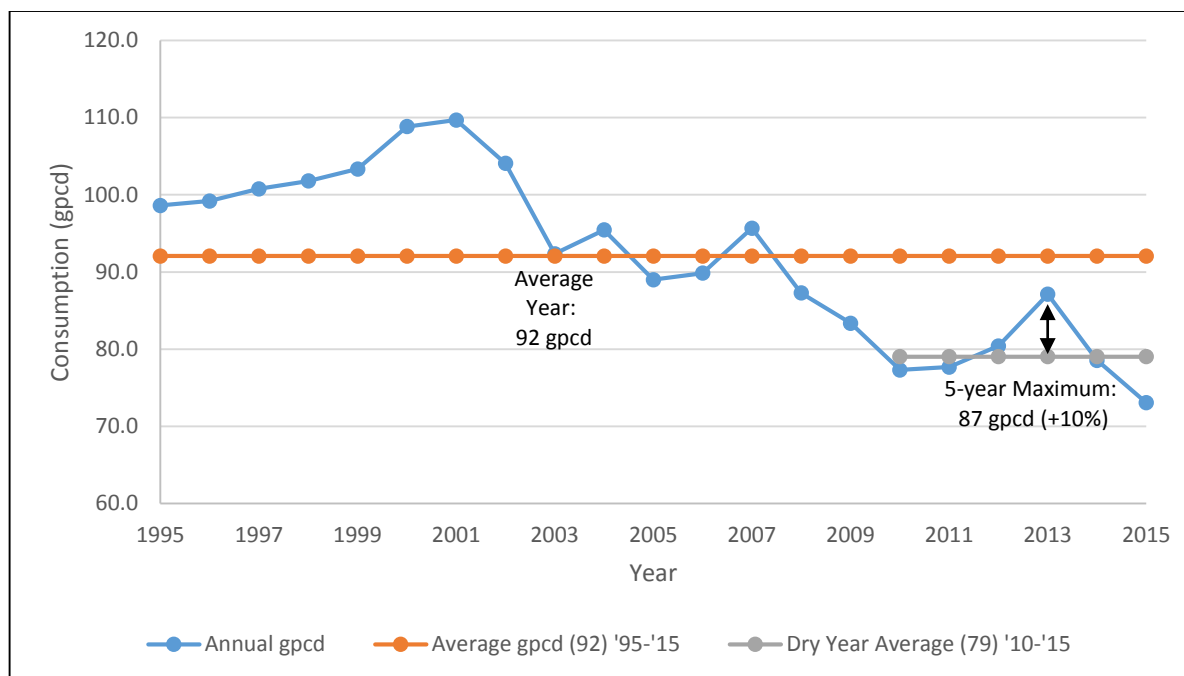


Figure 7.1 Historical Per Capita Consumption Variation

The years chosen to represent the dry-year scenarios were determined by examining precipitation records. Based on precipitation data, the DWP has experienced low rainfall levels in the last five years with the lowest level occurring in the year 2013. As shown in Figure 7.1, the average per capita demand during this 5-year period was 87 gpcd. The 2013 demand was 10 percent greater than the average gpcd demand over the 5-year period. Per capita consumption in the multiple-dry year period of 2012 to 2014 was 80, 87, and 79 gpcd, which are approximately 2 percent higher than the average use, 10 percent higher than the average use, and 1 percent lower than the average usage. The decrease in per capita demand during the last year of the multiple-dry year period is likely a result of conservation efforts. For conservative planning purposes and to imitate the effects of conservation efforts, demand was therefore increased by 10 percent for the single-dry year and 2 percent and 10 percent for the first 2 years in the multiple-dry year, and decreased by 1 percent for the third year of the multiple-dry year.

Despite changing conditions, the demand from groundwater has remained constant and is projected to do so in the future.

7.3 SUPPLY AND DEMAND ASSESSMENT

10635 (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from the state, regional, or local agency population projections within the service area of the urban water supplier.

The projected demand and supplies are compared in 5-year increments in Table 7.2, Table 7.3, and Table 7.4.

7.3.1 Average Year

As shown in Table 7.2, on an average year, demands are projected to increase up to 2,494 afy by year 2040. Since the DWP is able to pump up to 3,100 afy from the Basin, it is projected that DWP has sufficient supplies available to meet demand through year 2040 under average year conditions.

Table 7.2 Retail: Normal Year Supply and Demand Comparison (afy)					
Year	2020	2025	2030	2035	2040
Supply totals	2,169	2,246	2,326	2,408	2,494
Demand totals	2,169	2,246	2,326	2,408	2,494
Difference	0	0	0	0	0
Note: (1) Supplies are assumed to be equal to demand, up to 3,100 afy (DWP's share of the operating safe yield of the groundwater basin).					

7.3.2 Single-Dry Year

As described in the previous section, the projected average year water demand was increased by 10 percent to estimate the water demand during a single-dry year, which increases demands to 2,749 afy by year 2040. The projected demands are summarized in Table 7.3.

As shown in Table 7.3, based on the DWP's 3,100 afy operating safe yield, the DWP is projected to have sufficient supply available to meet water demand through 2040 for single-dry year conditions. Based on historical groundwater monitoring data, the groundwater levels have been steady and unaffected by the drought conditions in the recent years.

Since groundwater levels maintained stable levels, it is expected that the DWP will be able to operate up to the 3,100 afy operating safe yield during a single-dry year.

Table 7.3 Retail: Single Dry Year Supply and Demand Comparison (afy)					
Year	2020	2025	2030	2035	2040
Supply totals	2,391	2,476	2,563	2,654	2,749
Demand totals	2,391	2,476	2,563	2,654	2,749
Difference	0	0	0	0	0
Note: (1) Supplies are assumed to be equal to demand, up to 3,100 afy (DWP's share of the operating safe yield of the groundwater basin).					

7.3.3 Multiple-Dry Years

To estimate the water demand during multiple-dry years, the projected average year water demand was increased by 2 percent for the first year, 10 percent for the second year, and decreased by 1 percent for the third year. This increases demands to 2,749 afy by the year 2040. Based on recent historical data, demands reduced during the last year of the multiple-dry year as a result of conservation efforts. The projected demands are summarized in Table 7.4

Table 7.4 Retail: Multiple Dry Years Supply and Demand Comparison (afy)						
Year		2020	2025	2030	2035	2040
First year	Supply totals	2,207	2,286	2,367	2,451	2,538
	Demand totals	2,207	2,286	2,367	2,451	2,538
	Difference	0	0	0	0	0
Second year	Supply totals	2,391	2,476	2,563	2,654	2,749
	Demand totals	2,391	2,476	2,563	2,654	2,749
	Difference	0	0	0	0	0
Third year	Supply totals	2,156	2,233	2,312	2,394	2,479
	Demand totals	2,156	2,233	2,312	2,394	2,479
	Difference	0	0	0	0	0
Note: (1) Supplies are assumed to be equal to demand, up to 3,100 afy (DWP's share of the operating safe yield of the groundwater basin).						

As shown in Table 7.4, the DWP is projected to have sufficient supply available to meet water demands through the year 2040 for multiple-dry year conditions, which is within DWP's operating safe yield of 3,100 afy. Since DWP performs monthly groundwater monitoring, which has demonstrated that the groundwater basin levels have remained steady despite the ongoing drought, it is assumed that the operating safe yield will be sufficient to meet future demands.

7.4 REGIONAL SUPPLY RELIABILITY

<i>10620 (f) an urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.</i>

The DWP does not utilize imported water within its service area. As mentioned in Chapter 6, the DWP is currently in coordination with BBARWA, MWD, and BBCCSD to develop a Facilities Plan for the BVWSP. This project will maximize resources by retaining 2,000 afy within the Valley instead of exporting the secondary treated water to alfalfa fields in Lucerne Valley.

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Chapter 8

WATER SHORTAGE CONTINGENCY PLANNING

106312(a). The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier.

The UWMPA requires that UWMPs include an urban water shortage contingency analysis that includes stages of action to be undertaken in the event of water supply shortages; a draft water shortage contingency resolution or ordinance; prohibitions, consumption reduction methods and penalties; an analysis of revenue and expenditure impacts and measures to overcome these impacts; actions to be taken during a catastrophic interruption; and a mechanism for measuring water use reduction.

8.1 STAGES OF ACTION

10632 (a)(1) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

The following sections describe the DWP's water shortage stages and the conservation measures employed during each stage, as outlined in Resolution No. DWP 2007-02 (Appendix G). These stages are only enacted during a water shortage emergency and summarized in Table 8.1.

Table 8.1 Retail: Stages of WSCP	
Stage	Percent Supply Reduction ¹
I	5%
II	10%
III	25%
IV	45%

As shown in Table 8.1, the DWP has four conservation stages, depending on the supply reduction. The existence of Stage I, Stage II, Stage III, or Stage IV conservation conditions may be declared and adopted by the DWP in accordance with California State law.

8.1.1 Permanent Water Use Policies and Efficiency Requirements

Water use efficiency requirements are detailed in the DWP's rules and regulations. Violations are considered waste and an unauthorized use of water, which result in penalties

as outlined in Resolution No. DWP 2008-05 and Conservation Policy 2014-02 (see Appendix G).

1. No outdoor watering shall occur between 9 a.m. and 6 p.m. April 1 through November 1, annually.
2. Outdoor watering shall occur on an alternate day schedule with even addresses watering on evenly numbered days of the month and odd addresses watering on odd numbered days.
3. Customers are to keep water from running off onto adjacent properties, public or private roadways, and streets.
4. There is to be no hose washing of sidewalks, driveways, parking areas, tennis courts, patios, or other paved areas except when needed to protect public health and safety.
5. Customers are to repair all water leaks from any water line, faucet, toilet, etc. once detected.
6. All new structures shall be equipped with low flow faucets, showerheads, toilets, and urinals in compliance with current State Standards. All dishwashers and clothes washers must follow the U.S. Environmental Protection Agency's current guidelines.
7. The square footage of new turf, on new landscapes, shall be limited to 1,000. Existing landscapes that already contain 1,000, or more, square feet of turf may not install additional new turf. Existing landscapes that contain less than 1,000 square feet of turf may add turf for a total square footage, existing and new, of 1,000.

8.2 PROHIBITIONS ON END USES

106312(a)(4). Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(5) Consumption reduction methods on the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

8.2.1 Conservation Stage Restrictions

The mandatory prohibitions for each water shortage stage are detailed below and summarized in Table 8.2.

Conservation Stage I – (5 Percent Overall Reduction of Water Use, 15 Percent Outdoor Reduction of Water Use)

Conservation Stage I exists when the DWP Board of Commissioners reviews the recommendations of the Technical Review Team and determines that a drought, water supply shortage, or a threatened water shortage exists and reductions in customer allocations are necessary. In this case, an overall 5 percent reduction of water use will be required.

The following water conservation requirements apply during a declared Conservation Stage I, as outlined in Resolution 2007-02.

1. Hose washing of sidewalks, walkways, driveways, parking areas, patios, porches, or verandas is prohibited.
2. Landscape irrigation will be permitted only every other day, with addresses ending in odd numbers watering on odd numbered calendar days and addresses ending in even numbers watering on even numbered calendar days.
3. DWP water may not be used for soil compaction or dust control.
4. Washing of vehicles, trailers, buses, or boats anywhere but at commercial car washes must be conducted with the use of a bucket and a hose equipped with a shut-off nozzle.
5. Use of water from fire hydrants, except for fire protection, is prohibited.

Conservation Stage II – (10 Percent Overall Reduction of Water Use, 30 Percent Outdoor Reduction of Water Use)

Conservation Stage II includes all prohibitions and regulations as outlined in Stage I, plus the following:

1. Outdoor irrigation will be permitted only on days authorized by the DWP Board of Commissioners.
2. No new turf will be permitted in any location.

Conservation Stage III – (25 Percent Overall Reduction of Water Use, 60 Percent Outdoor Reduction of Water Use)

Conservation Stage III includes all prohibitions and regulations as outlined in Stages I and II, plus the following:

1. Outdoor irrigation will be permitted only two days per week, and will be specified by the DWP.
2. Irrigation of turf will be prohibited.
3. No DWP water will be used for ponds, streams, or fountains with a capacity of greater than 50 gallons.

Table 8.2 Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference <i>(optional)</i>	Penalty, Charge, or Other Enforcement?
I	Other - Prohibit use of potable water for washing hard surfaces	Includes sidewalks, walkways, driveways, parking areas, patios, porches, or verandas.	Yes
I	Landscape - Limit landscape irrigation to specific days	Permitted only every other day depending on address.	Yes
I	Other - Prohibit use of potable water for construction and dust control	Includes soil compaction or dust control.	Yes
I	Other	Washing of vehicles anywhere but at commercial car washes must use a bucket and a hose equipped with a shut-off nozzle.	Yes
I	Other	Prohibit use of water from fire hydrants, except for fire protection	Yes
II	Other	All restrictions and prohibitions from Stage I.	Yes
II	Landscape - Limit landscape irrigation to specific days	Permitted only on days authorized by the DWP Board of Commissioners.	Yes
II	Landscape - Other landscape restriction or prohibition	No new turf will be permitted in any location.	Yes
III	Other	All restrictions from Stage I and Stage II.	Yes
III	Landscape - Limit landscape irrigation to specific days	Permitted only two days per week, and will be specified by the DWP.	Yes
III	Landscape - Prohibit certain types of landscape irrigation	Irrigation of turf prohibited.	Yes
IV	Other	All restrictions from Stage I, Stage II, and Stage III.	Yes
IV	Other	Prohibit all outdoor water use, except commercial car washes that recycle water.	Yes

Conservation Stage IV – (45 Percent Overall Reduction of Water Use, 100 Percent Outdoor Reduction of Water Use)

Conservation Stage IV includes all prohibitions and regulations as outlined in Stages I, II, and III regulations, plus the following:

1. No outdoor water use will be permitted except commercial car washes that recycle water. This includes water for irrigation, water for ponds, streams, fountains, and swimming pools.

8.2.2 Defining Water Features

10632 (b). Commencing with the urban water management plan update due July 1, 2016, for purposes of developing the water shortage contingency analysis pursuant to subdivision (a), the urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

The DWP restricts water use for water features, such as fountains, unless the water is recirculated.

8.3 PENALTIES, CHARGES, OTHER ENFORCEMENT OF PROHIBITIONS

106312(a)(6). Penalties or charges for excessive use, where applicable.

The UWMPA requires the UWMP discusses the penalties or charges for excessive use during water shortages.

8.3.1 Excessive Use Penalties

Violations of the DWP's water use rules and regulations may be subject to penalties established in Resolution No. DWP 2008-05 and Conservation Policy 2014-02. The DWP may not terminate service due to a customer's failure to comply with the DWP's rules and regulations unless the DWP first gives notice of the violation and the consequence of the violation. Every failure to comply notice will include all of the following information.

- The name and address of the customer whose account is in violation of the DWP's rules and regulations.
- The specific nature of the violation.
- The deadline by which the customer must comply with the DWP's rules and regulations.
- The consequences of failing to comply with the DWP's rules and regulations.
- The telephone number of a DWP representative who can provide additional information regarding the notice.

When a notice of violation has been sent to an owner of a property that has multiple tenants, the DWP will endeavor to provide notice to each unit whether residential or commercial. Within fourteen calendar days of the date of the failure to comply notice, the customer must correct the violation or contact the DWP staff regarding correction of the violation. If the customer fails to correct the violation or contact the DWP staff regarding correction of the violation, the DWP will move forward with terminating service.

After contacting DWP staff, if DWP staff determines that the customer is unable to comply with the DWP's rules and regulations within the time period prescribed by the DWP but is willing to comply and has made reasonable progress towards compliance, the DWP may grant an extension for compliance, not exceeding twelve months. If, however, the customer has not made reasonable progress to comply with said rules and regulations, the DWP will proceed to terminate service unless the customer appeals that decision to the Board of Commissioners. The customer's failure to appeal, in the case where the customer is not making reasonable progress to comply with said rules and regulations, will result in the termination of service.

8.3.2 Review Process

A customer will have the right to a hearing before the Board of Commissioners, if the DWP receives a written request for such a hearing on or before five business days after the DWP staff renders a decision. The written request for a hearing will include a statement setting forth the reasons why the customer disagrees with the decision of DWP staff.

Documentation that substantiates the applicant's position must be submitted with the request for a hearing.

Upon request for a hearing, the General Manager will contact the customer regarding the proposed date for the hearing. The hearing will be conducted at the next regularly scheduled Board meeting for which the hearing can be placed on the agenda. If the Board does not render a decision at the hearing, the Board will render a written decision on or before five business days following the date of the hearing. The decision of the Board will be final.

Upon completion of the appeal process and a determination that the customer has failed to comply with the DWP's rules and regulations, the DWP may move forward with the termination of service.

8.4 CONSUMPTION REDUCTION METHODS

106312(a)(5). Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

The UWMPA requires that the UWMP include an urban water shortage contingency analysis that addresses methods to reduce demand within the service area, whereas the prohibitions in Section 8.2 limit specific uses of water.

8.4.1 Mandatory Prohibitions on Water Wasting

The DWP has permanent prohibitions in place for wasteful practices, including:

- Customers are to keep water from running off onto adjacent properties, public or private roadways, and streets.
- Customers are to repair all water leaks from any water line, faucet, toilet, etc. once detected.
- Upon a change in service all properties (residential, commercial, and industrial) shall be equipped with low flow faucets, showerheads, toilets, and urinals in compliance with State Standards.
- Washing vehicles must be done with a bucket and a hose with an automatic shut-off nozzle.
- All new and retrofitted landscapes with turf must be irrigated, using a sprinkler system with Automatic Irrigation Controllers and include the ability to accommodate all time and date restrictions employed by the DWP and must be equipped with one of the following: rain shut-off or soil moisture sensors or evapotranspiration adjustment capabilities.

The DWP's permanent consumption reduction methods are summarized in Table 8.3.

Table 8.3 Retail Only: Stages of WSCP - Consumption Reduction Methods		
Stage	Consumption Reduction Methods by Water Supplier	Additional Explanation or Reference (optional)
N/A	Offer Water Use Surveys	Letters sent to high use residential and commercial customers offering indoor and outdoor water audits.
N/A	Expand Public Information Campaign	Begin or enlarge media campaign, including bill inserts, newspaper articles, water efficiency workshops, educational outreach, etc.
N/A	Provide Rebates on Plumbing Fixtures and Devices	Rebates for toilets, clothes washer, etc.; Giveaway programs for shower head, aerator, automatic shut-off hose spray nozzles, etc.
N/A	Provide Rebates for Landscape Irrigation Efficiency	Rebates for landscape conversion, irrigation controllers, sprinkler heads.
N/A	Provide Rebates for Turf Replacement	Rebate program is currently \$0.50 per square foot.
Note: (1) All consumption reduction methods are permanent and not dependent on conservation stages.		

8.5 DETERMINING WATER SHORTAGE REDUCTIONS

UWMPs must include an urban water shortage contingency analysis that addresses a method to measure the reduction in demand.

106312(a)(9). A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

The DWP's water system currently has water meters on all connections. In 2014, the DWP began a meter replacement program to replace each of the DWP's meters with a radio-read meters (or smart meters). The DWP is currently a year ahead of schedule and has installed over 6,000 radio-read meters to date with anticipated project completion by the summer of 2019. DWP will use these meters to monitor district-wide use, individual customer use, and track actual reductions in water use. The purpose of this Advanced Metering Infrastructure (AMI) system is to better track water system demands in real time and measure effects of conservation measures. By tracking real time data of water system demands, the DWP is able to educate customers regarding water use and also identify leaks and other areas where additional conservation may be possible.

8.6 REVENUE AND EXPENDITURE IMPACTS

UWMPs are required to include an urban water shortage contingency analysis that addresses the financial impacts from reduced water sales.

10632(a)(7). An analysis of the impacts of each of the actions and conditions described in paragraphs (1) to (6), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

The DWP has adjusted their budget based on the reduction of consumption. However, the current rate structure is drought resistant in that 76 percent the revenue is fixed and built into the service fee. Since the DWP is not as vulnerable to water sales fluctuation and is able to compensate any loss with reserves, the DWP does not implement any emergency surcharges.

8.7 RESOLUTION OR ORDINANCE

UWMPs are required to include an urban water shortage contingency analysis that includes a draft or approved/adopted water shortage contingency resolution or ordinance.

10632(a)(8) A draft water shortage contingency resolution or ordinance.

The DWP's Water Shortage Response Plan is outlined in Resolution 2007-03 and Resolution 2007-02 (see Appendix G).

8.8 CATASTROPHIC SUPPLY INTERRUPTION

UWMPs must include an urban water shortage contingency analysis that addresses catastrophic interruptions of water supplies.

10632(a)(3) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

During declared shortages, or when shortage declarations appear imminent, emergency regulations can be enacted by the DWP Board of Commissioners or the General Manager. Declared emergencies will be addressed in three phases as outlined in Resolution DWP No. 2007-03.

8.8.1 Assessment Phase

The Assessment Phase is defined as beginning upon the declaration of an emergency at the inception of the event. Upon the declaration of an emergency DWP staff will assess the emergency and its potential effects on the DWP's ability to provide water for human consumption, sanitation, and fire protection. This assessment should be completed within 48 hours or less.

Use of water outdoors for other than emergency purposes will be prohibited. Use of water indoors for purposes other than human consumption, sanitation, and fire protection will be prohibited. All other water use will be minimized.

8.8.2 Emergency Phase

The Emergency Phase will begin and continue as long as emergency conditions persist. Use of water outdoors for other than emergency purposes will be prohibited. Use of water indoors for purposes other than human consumption, sanitation, and fire protection will be prohibited. All water use will be minimized.

8.8.3 Recovery Phase

The Recovery Phase will last until normal conditions return to the DWP service area. The use of water outdoors for other than emergency purposes will be prohibited, unless the General Manager determines that restricted outdoor water use is reasonable given the current state of the DWP's water system. When restricted outdoor use is permissible, the public will be provided with a specific list of approved outdoor water uses. All water use will be minimized.

8.9 MINIMUM SUPPLY NEXT THREE YEARS

The CWC requires that the DWP estimate the minimum water supply available at the end of the 12, 24, and 36 months (2016, 2017, and 2018), assuming the driest three-year historic supply shortage.

10632(a)(2) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

The DWP does not anticipate significant decreases in available supply in the Basin. Thus, the minimum water supply is assumed to be the projected demand, not exceeding the Basin's safe yield of 3,100 afy. The estimate for the minimum supply for the next three years is included in Table 8.4.

Table 8.4 Retail Only: Minimum Supply Next Three Years			
Year	2016	2017	2018
Available Water Supply	2,110	2,124	2,139
<u>Note:</u> (1) Assumed to be the DWP's projected demand with a maximum of 3,100 afy (the safe yield for the Basin).			

Chapter 9

DEMAND MANAGEMENT MEASURES

The UWMPA requires that the UWMP involve a comprehensive discussion of the agency's water conservation measures. This includes an overview of the supplier's DMM as well as a discussion of how the supplier intends to meet the water conservation targets established by SB X7-7.

10631 (f)(A)...The narrative shall describe the water demand management measure that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.30. (B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

- (i) Water waste prevention ordinances
- (ii) Metering
- (iii) Conservation pricing
- (iv) Public education and outreach
- (v) Programs to assess and manage distribution system real loss
- (vi) Water conservation program coordination and staffing support.
- (vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measure, if implemented.

The DWP has been a member of the California Urban Water Conservation Council (CUWCC) since December 2004 and is therefore a signatory to the Memorandum of Understanding (MOU) regarding urban water conservation in California. The DWP's 2010 UWMP provided information regarding conservation measures already in place and those that would improve the efficiency of water use within the service area. In 2014, the retail agency DMMs were simplified from 14 specific measures to six more general requirements plus an "other" category based on recommendations from the Independent Technical Panel (ITP). The consolidated retail requirements are listed below:

- Water waste prevention ordinances
- Metering
- Conservation pricing
- Public education and outreach
- Programs to assess and manage distribution system real loss
- Water conservation program coordination and staffing support
- Other demand management measures

9.1 WATER WASTE PREVENTION ORDINANCES

As part of the DWP's Water Conservation Program (Policy #2014-02), several water use policies have been implemented to prevent water waste. The policy requires that water should be used reasonably and productively at all times.

Regulations require customers to repair all water leaks from any water line, faucet, toilet, etc. once detected. In addition, all new structures must be equipped with low flow faucets, showerheads, toilets, and urinals in compliance with current state standards. All dishwashers and clothes washers must follow the U.S. Environmental Protection Agency's current guidelines.

For outdoor use, the DWP does not allow water run-off onto adjacent properties, public, or private roadways, and streets. Vehicle washing must be completed with a bucket and a hose with an automatic shut-off nozzle. The policy also restricts hose washing of sidewalks, driveways, parking areas, tennis courts, patios, or other paved areas except when needed to protect public health and safety. Fire hydrants are only used for fire protection purposes and approved construction purposes.

Restrictions have also been placed on landscaping. Outdoor watering is restricted to alternate days, based on the customers address, and is restricted to the hours between 6 p.m. and 9 a.m. All outdoor irrigation must be shut-off and winterized between November 1 and April 1, annually.

All new and retrofitted landscapes must follow the requirements for landscape plan submittals, turf installation guidelines, irrigation requirements and systems, ground water recharge and erosion control, and water feature installation as identified in the Water Conservation Program (see Policy 2014-02 in Appendix G). For new landscapes, turf and water features combined may not occupy more than 25 percent of the landscaped area in all proposed landscapes and decorative fountains and water features must use re-circulating systems. Landscape Elements are expected to be appropriately maintained to maximize Water-Use Efficiency and grouped by similar irrigation requirements. Irrigation systems must be set up to irrigate individual water-use zones in accordance with their individual needs. All new and retrofitted landscapes with turf must be irrigated, using a system with Automatic Irrigation Controllers. Automatic Irrigation Controllers must have the ability to accommodate all time and date restrictions employed by the DWP and must be equipped with one of the following: rain shut-off, soil moisture sensors, or have evapotranspiration adjustment capabilities.

The DWP works diligently in implementing the water waste prevention restrictions and imposes consequences on those that fail to comply. The DWP sends a notice of violation and an impending consequence of the violation to those that fail to comply. Within fourteen calendar days, the customer must correct the violation or contact the DWP staff regarding the correction of the violation. If the customer fails to correct the violation or contact the DWP staff, the DWP will terminate service and the customer can be reinstated once the correction has been made. The customer has the ability to appeal the violation before the Board of Commissioners within five days of notice.

9.2 METERING

Agencies are required to install water meters on all municipal and industrial service connections located within its service area by year 2025. The DWP does not have any industrial meters within its service area. Beginning in 1989, the DWP required water meters for all new and existing services. The last non-metered account was changed to a metered account in 2003. The DWP is fully metered and customers within the DWP's service area are billed for usage. The DWP considered implementing a program that provided incentives to exchange mixed-use accounts to install dedicated landscape meters, but determined such a program would not be cost effective. The DWP found it more cost effective and water efficient to pursue a total reduction in heavily irrigated landscapes, which was accomplished through a landscape ordinance (see Appendix G) and a Turf Buy-Back Program.

To better track water system demands in real time and measure the effects of conservation measures, the DWP's Board of Commissioners approved an AMI project to replace all of the meters in the system with new meters and radio read technology. The DWP conducted extensive research and testing on eleven different types of meters from five different manufacturers and five different radio read systems. Upon completion of the research and testing, the DWP selected the Sensus Accustream and Omni meters and Sensus 520M MXU radio system. The DWP began installing Sensus AccuSTREAM composite meters with Sensus 520M MXU radios in October 2014. To date, over 6,000 Sensus meters have been installed, and the project is one year ahead of schedule.

9.3 CONSERVATION PRICING

The UWMPA requires each agency to describe the pricing structure, including a conservation pricing structure. Conservation pricing can come in different forms, including a tiered rate structure or water budgets.

The DWP applies a tiered rate schedule to all residential connections ranging from \$2.64 to \$12.53 per ccf billed bi-monthly as listed in Table 9.1. Through the DWP's tiered pricing structure, customers are encouraged to minimize landscape water use in order to avoid high water bills. New customers, and those changing service, are notified of the landscape water use regulations. The DWP also has a high use outreach program in which identified "high-use" residential customers utilizing over 25 CCF per month are sent a letter including conservation brochures and offering free indoor or outdoor audits to help them find ways to conserve. Unlike the tiered rate schedule for residential connections, commercial customers pay a flat rate of \$3.79 per ccf and are billed on a monthly basis as listed in Table 9.1. The rates presented in Table 9.1 are in accordance with Ordinance No. 2013-424, which increases the usage fee on July 1st of each year through year 2017.

Table 9.1 Rate Structure		
Consumption (hcf)	Tier	Rate/ccf
9-24	One	\$2.64
25-40	Two	\$3.67
41-60	Three	\$5.47
61-100	Four	\$9.31
101+	Five	\$12.53
5+	Commercial Rate ¹	\$3.79
Notes: (1) Commercial customers are billed monthly, whereas residential customers are billed bi-monthly. (2) Rates are current as of March 2016 and available at: http://www.bbldwp.com/		

In addition to volume charges, a bi-monthly service charge is assessed based on usage type and meter size and varies from \$51.92 to \$156.94.

Table 9.2 Service Charge		
User Type	Meter Size	Service Charge^{2,3}
Residential	5/8 inch meter	\$87.66
Residential	1 inch meter	\$156.92
Commercial ¹	5/8 inch meter	\$51.92
Commercial ¹	1 inch meter	\$86.55
Notes: (1) Commercial customers are billed monthly, whereas residential customers are billed bi-monthly. (2) Bi-monthly service charge includes 8 ccf per cycle for residential customers and 4 ccf per cycle for commercial customers. (3) Rates are current as of March 2016 and available at: http://www.bbldwp.com/		

9.4 PUBLIC EDUCATION AND OUTREACH

The DWP educates the public and businesses on water supply issues and conservation through a variety of means, including local newspapers and radio advertisements, restaurant table cards, bill inserts, business placards, and various platforms of social media.

The DWP posts seasonally appropriate signage at high traffic points within its service area, offers lists of drought tolerant and native plants, and conducts presentations for community groups, such as Kiwanis, Rotary, and the Sierra Club. The DWP has also partnered with agencies such as meals on wheels and the electric company to distribute collateral materials on finding and fixing leaks in resident's homes.

In July 2012, the DWP broke ground on the Xeriscape Demonstration Garden, which is approximately 380 square feet with 7 zones representing various garden themes such as

"A Weekender's Dream" and "It's a Colorful Life." The Xeriscape Demonstration Garden is open to the public along a busy street and serves to educate the residents and visitors on water-efficient landscape design, particularly in the mountain community. The DWP also features drought tolerant gardens at the front entrance of the DWP building where customers come to pay their bills, open accounts, and get information.

The DWP annually sponsors and participates in the Xeriscape Garden Tour, which features 7 to 8 homes and businesses, and attracts 300 to 650 attendees each year. The DWP also conducts public events at the garden, including a Water Wise Gardening presentation.

In addition to public events at the garden, the DWP also participates in information booths at fairs and other public events, such as the Earth Day event hosted by the neighboring Bear Valley Electric Service, a Realtor Association presentation, and Kiwanis Club presentations. The DWP also hosts school education programs, including a water cycle education program, a drought program and production tours for middle and high school children.

9.5 PROGRAMS TO ASSESS AND MANAGE DISTRIBUTION SYSTEM REAL LOSS

A water audit is a process of accounting for water use throughout a water system in order to quantify unmetered water usage. Non-revenue-water is the difference between metered production and metered usage on a system-wide basis.

The DWP performed a full water system audit in 2001, when 167 miles of the distribution system were surveyed. The DWP has been active in locating and repairing leaks, and responding immediately to repair leaks. Field personnel are trained to recognize potential service and main line leaks. Pipelines with chronic leak problems are replaced.

When the DWP purchased the system from Southern California Water Company in 1989, the percent of unaccounted-for-water was 29.6 percent. At that time, the DWP applied for and obtained a low-interest loan from the State of California, and began a significant leak detection and repair program. Between 1990 and 2000, the DWP replaced over 108,000 feet (20.5 miles) of pipelines in the system, reducing the unaccounted-for-water from 29.6 to 11.05 percent. Recent records show a 9.7 percent unaccounted-for-water loss, which is typical for Southern California water agencies.

Since 1989, the main focus of the DWP's Capital Improvement Plan has been on supply facilities and pipeline replacement. The DWP has replaced several well pumping units and constructed new wells to improve the quantity and quality of pumping facilities. The DWP replaced 5.5 mile of pipelines during the summer of 2012 and a half mile of pipeline in the Erwin Lake area in 2013-2014. The DWP also constructed 1.7 miles of new pipelines associated with the Arrastre Creek Well and Angels Camp Reservoir Projects.

The DWP conducts regular mass balance audits of metered water production versus metered water sales to detect unusual changes in the water operation. The goal is to minimize water losses and increase overall system efficiencies. Ten years ago, the DWP averaged 40 to 50 main leaks per year. Currently, the DWP averages about five to ten main line leaks per year. As part of the 2014 Capital Improvement Plan, the DWP staff is going to replace 1,000 LF of undersized steel pipeline and will focus on areas prone to freezing and on steel water mains located within back lot easements; relocating those mains to street rights-of way.

The DWP recently approved a hydraulic modeling project, which is scheduled for completion in late 2016. The model will assist in identifying existing system deficiencies that will be utilized to develop a list replacement projects that will be prioritized in a 15 year Capital Improvement Plan. The current GIS database contains a complete inventory of all pipelines in the service area along, which include data regarding the pipelines age, material, and diameter. This information, along with the hydraulic model, will form the basis for developing a 75 or 100-year pipeline replacement program.

The DWP recently applied to the WaterSmart grant program for funding of the Big Bear Boulevard Pipeline Replacement project. The proposed project is located within Big Bear Boulevard right-of-way. The existing 12-inch riveted, unlined steel pipeline was constructed in 1947 and is nearly seventy-years old. The 12-inch Big Bear Boulevard Transmission main is a key transmission facility within DWP's system and is nearly 21,000 linear feet. Due to frequent leaks, DWP began replacing the steel Big Bear Boulevard Pipeline in 1990. Although grant funding has not been received, approximately 17,000 linear feet of the Big Bear Boulevard steel pipeline have been replaced and the remaining 4,000 linear feet will be replaced by fall 2016.

9.6 WATER CONSERVATION PROGRAM COORDINATION AND SUPPORTING STAFF

The DWP employs one full-time staff person as Water Conservation and Public Information Specialist and one part-time Water Conservation Technician to manage the responsibilities of the water conservation program.

9.7 OTHER DEMAND MANAGEMENT MEASURES

9.7.1 Indoor Conservation Consults/Audits

The DWP offers all residential and commercial customers free indoor water conservation consultations. In the process, staff checks showerheads, faucets, and toilets for leaks and flow rates. If an item fails to meet current state and/or federal standards they are offered a rebate or free low-flow fixture. From January 2011 through December 2015, the DWP conducted at least 782 indoor water audits/consultations.

Every new customer receives a new customer information packet informing them of all the rules and regulations, as well as survey programs and rebates. Existing customers are informed of the program through bill inserts, radio commercials, newspaper advertisements, community events, social media pages, and the DWP website (BBLDWP.com).

According to the California Urban Water Conservation Council 2005 BMP Costs and Savings Study, residential surveys result in a savings range of 21-32.2 gpd depending on whether it is a targeted household or not.

9.7.2 Incentive and Rebate Programs

The DWP provides a limited number of water efficient items, shower timers and rain gauges, to current account holders for free at the front counter of the DWP office or upon request, as well as other water efficient items found useful upon completion of an indoor or outdoor audit, such as high efficiency showerheads and low flow faucet aerators. In addition, the DWP offers rebate programs, such as high efficiency toilet rebates and the turf buyback program. Current free items and rebate incentives are summarized in Table 9.3.

Based on inventory and ordering data, from calendar year 2011 through calendar year 2015, the DWP granted rebates for 713 low flow toilets and gave away approximately 1,188 showerheads, 1,428 bathroom aerators and 300 kitchen aerators. While the DWP records devices given away on each survey form and at the counter, it is more difficult to account for all devices given away at community events. In the process of data entry, the DWP has also discovered that not all surveys or devices distributed have been recorded and some information from 2011 is missing resulting from a change in software. Therefore, true savings may be higher based on inventory and items given away that have not been recorded. A summary of the known number of items given in years 2011 to 2015 is shown in Appendix H.

The high efficiency toilet rebate program provides a rebate of \$50 to \$100 per toilet with a maximum of two toilets per household. Prior to installation, DWP conservation staff performs an indoor audit to confirm the existing toilet is a non- ultra-low flush toilet (ULFT). Once the toilet has been installed, the customer delivers a receipt or invoice to the DWP, along with proof that the new ULFT has been installed, and the rebate is issued (usually as a credit on the customer's water bill).

Table 9.3 Free items and Rebates	
Program	Description
Free at front desk of DWP office or upon request	
Shower Timer	1 free per household, available to DWP customers at DWP office
Dish scraper	1 free per household, available to DWP customers at DWP office
Rain Gauge	1 free per household, available to DWP customers at DWP office
Leak Detection Tablets	Available free to DWP customers at DWP office
Other free items	
Low Flow Faucet Aerators	Provided free (to replace higher use, broken or missing aerators) upon completion of an indoor audit
Weather-Based Irrigation Controller	Provided free upon request, customer must pay service fee
High Efficiency Showerhead	Provided free (to replace higher use showerheads) upon completion of an indoor audit
High Efficiency Auto Shut-off Hose Nozzle	Provided free (if missing and needed) upon completion of an indoor or outdoor audit
Soil Moisture Sensor	Provided free during an outdoor audit
Rebates	
High Efficiency Toilet Rebate	Up to a \$100 rebate for replacing a toilet exceeding 1.6 gallons GPF with 1.28 GPF or less. Up to a \$50 rebate for replacing a toilet with a flush volume of 1.6 GPF with 1.28 GPF or less. Limit two per residential household, commercial/industrial may be allowed additional rebates. Requires pre-inspection before the old toilet is removed, receipt/invoice and proof of new toilet installation.
Turf Buyback	\$0.50 per square foot, no minimum, and no limits-commercial, industrial, institutional, or residential.

The DWP calculated the water savings from toilet replacement to be 31 gallons per day per toilet. For purposes of this BMP, 31 gpd per toilet, or 0.0347 acre-feet per year per toilet will be used in both single- and multi-family dwellings. The cost per acre-foot of water savings is approximately \$2,111 for toilet rebates and \$6,700 for direct installs for the first year. Assuming a 20-year life for a toilet, the cost per acre-foot over the lifetime of the toilet comes out to \$106 per acre-foot for rebates, and \$335 per acre-foot for direct installs. While the cost per acre-foot for rebates is significantly cheaper than for direct installs, customer participation is much higher for direct installs, allowing more toilets to be retrofitted. The

WDO fee was replaced in 2009 and funding for the toilet rebate program now comes from DWP's operations and maintenance budget.

The DWP instituted a Retrofit on Change of Service program, Resolution No. DWP 2014-05 (see Appendix G). This resolution requires that all faucets and showerheads have flow rates of 2.5 gallons or less and toilets have a volume of 1.6 gallons per flush or less. Property owners must inspect fixtures to ensure compliance and provide a signed certificate to the DWP. Since 2005 to 2016, the DWP has provided a \$100 rebate per toilet for up to two toilets.

Water savings based on installing low-flow showerheads, faucet aerators, and toilet displacement devices was estimated by the CUWCC to be 5.5 gallons per day (gpd), 1.5 gpd, and 4 gpd respectively. All three devices are generally distributed concurrently, so for the purposes of this DMM the total estimated water savings is based on the cumulative savings of 11 gallons per day.

9.7.3 Landscape surveys and turf buybacks

Landscape surveys are performed by the Water Conservation Specialist or Technician upon request. During these surveys, the Specialist or Technician examines the sprinkler system, landscaping, and makes recommendations for improving water use efficiency. The DWP provides a number of incentives to encourage landscape water use efficiency. In 2005, a Turf Buy-Back Program was implemented in which the DWP reimburses customers who voluntarily removed turf from their property. Under this program, the reimbursement rate is now \$0.50 per square foot with no minimum or maximum amount limitations.

From January 1, 2011 to December 31, 2015 the DWP issued \$61,408.75 in turf buybacks to customers who removed a total 85,821 square feet of grass. It is difficult to determine the water savings from turf removal due to multiple factors, including customers that may stop watering their lawn before having it removed, replacing the lawn with other water-thirsty plants, and the possibility of using slightly more water than usual to establish new plants once the lawn is removed. In addition there are changes to the account holders, seasonal and annual changes in the weather and the general trend toward conservation.

However, based on an informal survey of six customers who partook in the DWP turf removal program between the summer of 2009 and the summer of 2013, the DWP estimates water savings to be approximately 28.12 gallons per square foot per summer (a six month period generally ranging May 1 to October 31). Since the DWP's watering regulations only allow outdoor irrigation from April 1 through the end of October, it is reasonable to calculate water savings on this summer irrigation period. The DWP used data from customers who removed more than 1,000 square feet of turf and estimates water savings at 7.41 acre feet per year resulting from the grass removed in the last five years. Over the lifetime of the program customers have removed over 393,178 square feet of turf resulting in an approximate annual savings of nearly 34 acre feet.

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Chapter 10

PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

The DWP prepared this 2015 UWMP during the spring of 2016.

10.1 INCLUSION OF ALL 2015 DATA

The 2015 UWMPs must include the water use and planning data for the entire year of 2015. The DWP is reporting on a calendar year basis and therefore, 2015 data includes the months of January to December 2015.

10.2 NOTICE OF PUBLIC HEARING

A public hearing was held prior to adoption of the UWMP on June 28, 2016. Notices were provided to cities and counties, and the public. The public hearing provides an opportunity for the public to provide input to the plan before it is adopted.

10.2.1 Notice to Cities and Counties

10621(b) Every urban water supplier required to prepare a plan shall... at least 60 days prior to the public hearing on the plan... notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

10642... The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area...

The cities and counties to which the DWP provides water supplies were provided 60 day notification (prior to the public hearing) that the DWP is in the process of preparing the 2015 UWMP. As shown in Table 10.1, the cities and counties were also provided a notice of public hearing, including the time and location of the public hearing. The 60-day notification letters and notice of public hearing to cities and counties are included in Appendix C.

Table 10.1 Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
<i>City of Big Bear Lake</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
County Name	60 Day Notice	Notice of Public Hearing
<i>San Bernardino County</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

10.2.1 Notice to the Public

The UWMPA requires that the UWMP show the water agency solicited public participation. The notice to the public is to be included in a local newspaper as prescribed in Government Code 6066. This notice will include the time and location of the public hearing, in addition to the location of where the UWMP is available for public inspection. The notice of public hearing to the public is included in Appendix C.

10642... Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection... Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code...

On June 1, 2016 and June 8, 2016, the DWP placed a notice in the Big Bear Grizzly (Local newspaper) stating that its UWMP was being updated and that a public hearing would be conducted to address comments and concerns from members of the community. The notice stated that a public review period would be scheduled through June 28, 2016. A copy of this notification is included in Appendix C. The Draft 2015 UWMP was made available for public inspection at the DWP's office, as well as the DWP's website (www.bbldwp.com).

10.3 PUBLIC HEARING AND ADOPTION

10642... Prior to adopting a plan, the urban water supplier shall hold a public hearing thereon.

10608.26(a). In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

- (1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.
- (2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.
- (3) Adopt a method, pursuant to subdivision (b) of Section 10608.20 for determining its urban water use target.

10642... After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

The plan was adopted at a public hearing by its Board of Commissioners on June 28, 2016. The hearing provided an opportunity for the DWP's customers, residents, and employees to learn and ask questions about the current and future water supply of the DWP's service area.

10.4 PLAN SUBMITTAL

The public hearing was followed by submittal of the UWMP to DWR, the California State Library, and Cities and Counties.

10.4.1 Submission to DWR

The 2015 UWMP will be submitted to DWR within 30 days of adoption and by July 1, 2016. A completed UWMP checklist is available in Appendix C.

10.4.2 Electronic Data Submission

The 2015 UWMP, in addition to tabular data, will be submitted using WUEdata submittal tool.

10.4.3 Submission to the California State Library

The 2015 UWMP will be submitted in CD or hardcopy format to the California State Library within 30 days of adoption.

10.4.4 Submission to Cities and Counties

The 2015 UWMP will be submitted in electronic format to cities and counties within 30 days of adoption.

10.5 PUBLIC AVAILABILITY

Within 30 days of submitting the UWMP to DWR, the adopted UWMP will be available for public review during normal business hours at the locations specified herein.

10.6 AMENDING AN ADOPTED UWMP

The plan may be updated at any time when the urban water supplier believes significant changes have occurred in population, land use, and/or water sources that may affect the contents of the plan. Copies of amendments or changes to the plan shall be submitted to DWR, the California State Library, and any cities or counties which the City provides water supplies within 30 days of adoption.

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